THE IRON AGE

Published every Thursday Morning by David Williams Co., 14-16 Park Place, New York.

Vol. 80: No. 20. *New York, Thursday, November 14, 1907*

$5.00 a Year, Including Postage. Single Copies, 15 Cents.

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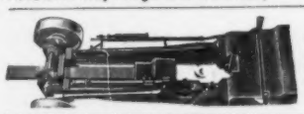

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THE IRON AGE

New York, Thursday, November 14, 1907.

Ore Handling Plant at South Bethlehem, Pa.

The Car Dumper and Other Features of the Bethlehem Steel Company's System.

In connection with its extensive programme of new construction at South Bethlehem, Pa., including a new blast furnace, the reconstruction of its old furnaces and the building of open hearth furnaces and rail and structural mills, the Bethlehem Steel Company has developed a new system of ore handling. This involved not only means of economically unloading the ore received, but also provision for storing ore and the necessary equipment for conveying it to the blast furnace bins and thence to the furnace skips. The same equipment provided for ore answers also for coke and limestone, so that all raw materials for the company's blast furnaces are dumped from cars, stored temporarily in a trough or longer on stock piles, or taken direct in transfer cars to furnace bins.

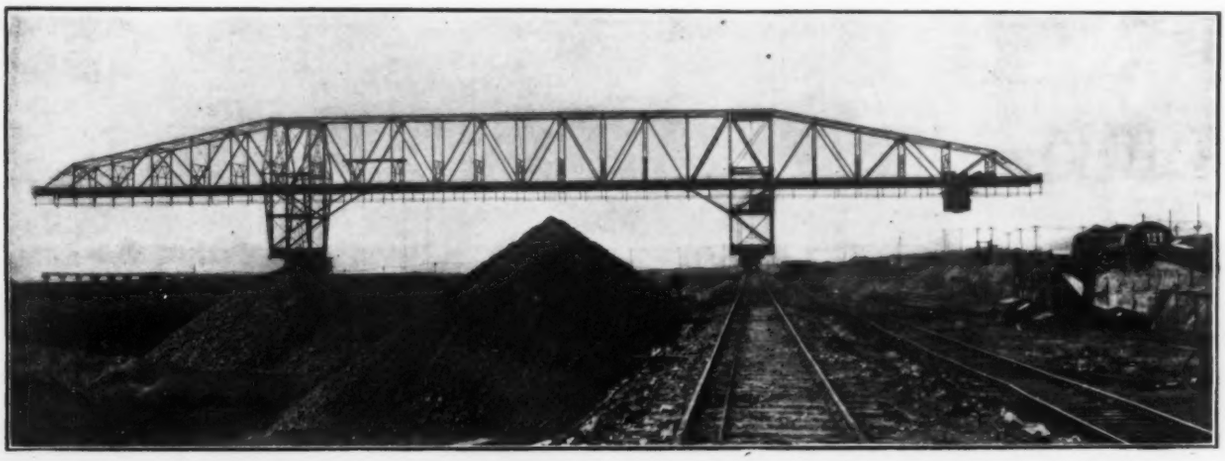


Fig. 1.—General View of Ore Handling Plant at South Bethlehem, Pa.

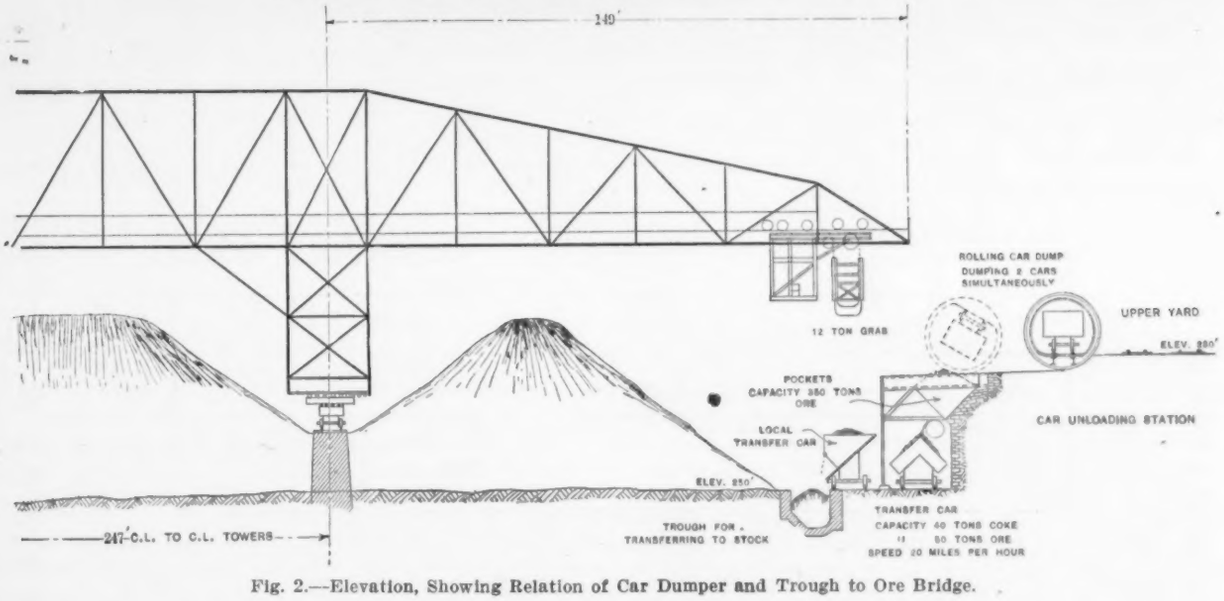


Fig. 2.—Elevation, Showing Relation of Car Dumper and Trough to Ore Bridge.

While some Lake Superior ore is shipped from Lake Erie ports to South Bethlehem, the bulk of the receipts are from Philadelphia over the Philadelphia & Reading Railroad, the ore coming from the Bethlehem Steel Company's mines in the Santiago District of Cuba. The ore in sight at these properties, it may be said in passing, has been increasing under the development work of the past year, and it is now being mined at the rate of about 400,000 tons a year. For the handling of the ore, coke and limestone trains as they arrive at South Bethlehem, an extensive gravity switching yard has been laid out, with trackage sufficient for holding a large tonnage of raw materials. Thus the supply of loaded cars is such, except for extraordinary interruptions, that continuous operation of the unloading plant is made possible.

The ore stock yard is located midway between the old plant of the company at South Bethlehem and the new or Saucon plant. The ore unloading machinery, consisting of a car dumper and the ore bridge, by which ore is deposited on stock pile, are thus about three-fourths of a mile from the blast furnaces. The conformation of the yard surface is such that the ore storage space is considerably lower than the railroad yard level. The car dumper is thus on a bank overlooking the ore yard, and for the tracks below the car dumper on which ore transfer cars run, excavation had to be made and retaining walls built. These transfer tracks, however, are still much above the furnace yard level, and most of the haul to the furnace bins is over a trestle, which for the greater part of its length is 30 ft. above the ground level. The total length of the trestle, including the furnace bin system

in which it terminates is 2694 ft. It consists of 30-ft. spans strongly built and carries two three-rail tracks. While it is the intention, and is preferable, to pass all raw material through the car dumper and send it to the furnace bins in special side dumping transfer cars, the third rail on each of the trestle tracks makes it possible to take railroad cars over the trestle and unload coke, ore and limestone directly into the furnace bins.

The Car Dumper.

Of the various features of the new ore handling plant interest centers in the car dumper, which is given more or less prominence in each of the accompanying illustrations. It was erected by Hoover & Mason, Chicago, who also had the contract for the ore bridge, the receiving pockets at the car dumper, the transfer cars, the trestle leading to the furnaces, and for the bin system, with scale cars and other accessories, at the furnaces. Fig. 1 gives a general view of the ore unloading and stocking system. Fig. 2 is an elevation of the dumper, receiving pockets, ore trough, and a portion of the ore bridge, showing their relation to the latter. Figs. 3 and 4 give end and plan views of the dumper, while Figs. 5, 6 and 7 illustrate the construction and operation of the pusher car and dumper and the method of loading into transfer cars.

The car dumper is of the rolling type—a huge steel barrel-like structure, 90 ft. in length, admitting two cars at a time. Three heavy steel forged bands encircling the dumper, one at each end and the third midway, all 22 ft. 11 in. in diameter, roll on steel tracks as the structure revolves. Each of the end rings is grooved to receive a plow steel cable of 1¼ in. diameter, and the central ring, the face of which is double the width of the end rings, has two grooves for similar cables. One end of each cable is secured to a drum located on the opposite side of the bins from the car dumper. The other end is anchored in front of the dumper. The operation is that

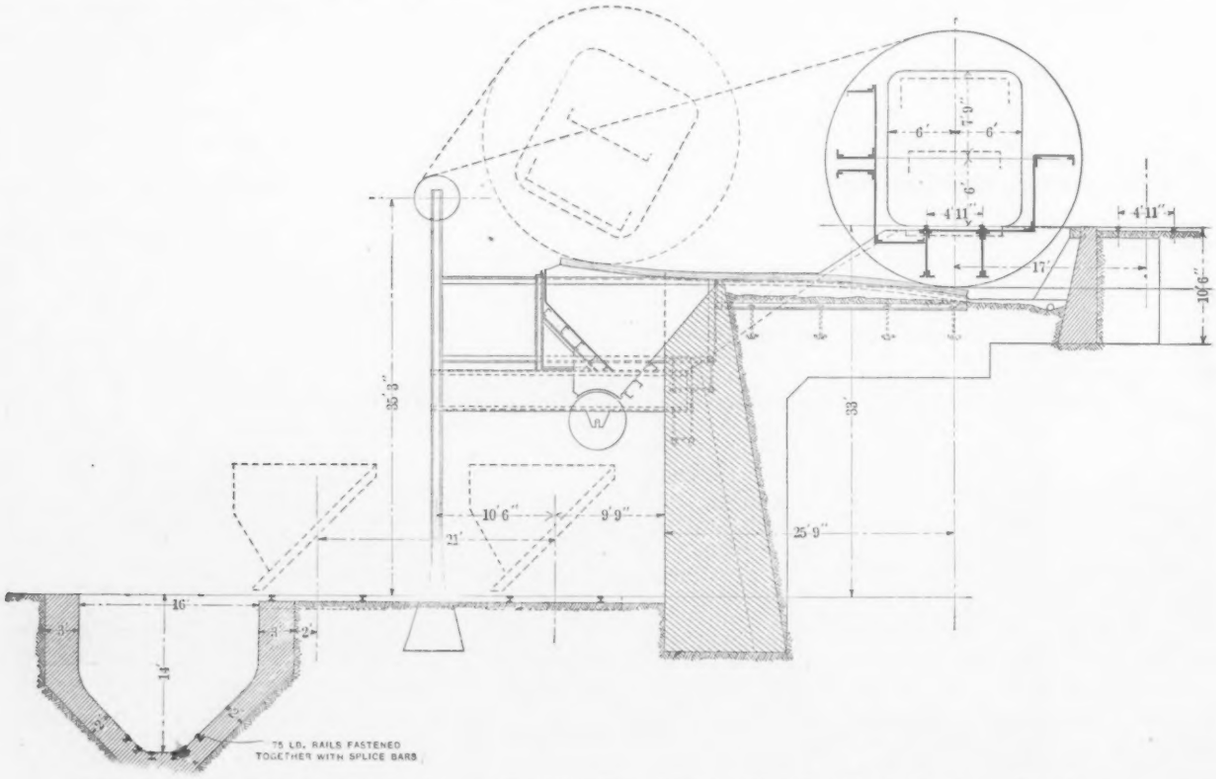


Fig. 3.—Sectional Elevation of Car Dumper, Retaining Wall, Receiving Bins, Transfer Cars and Ore Trough

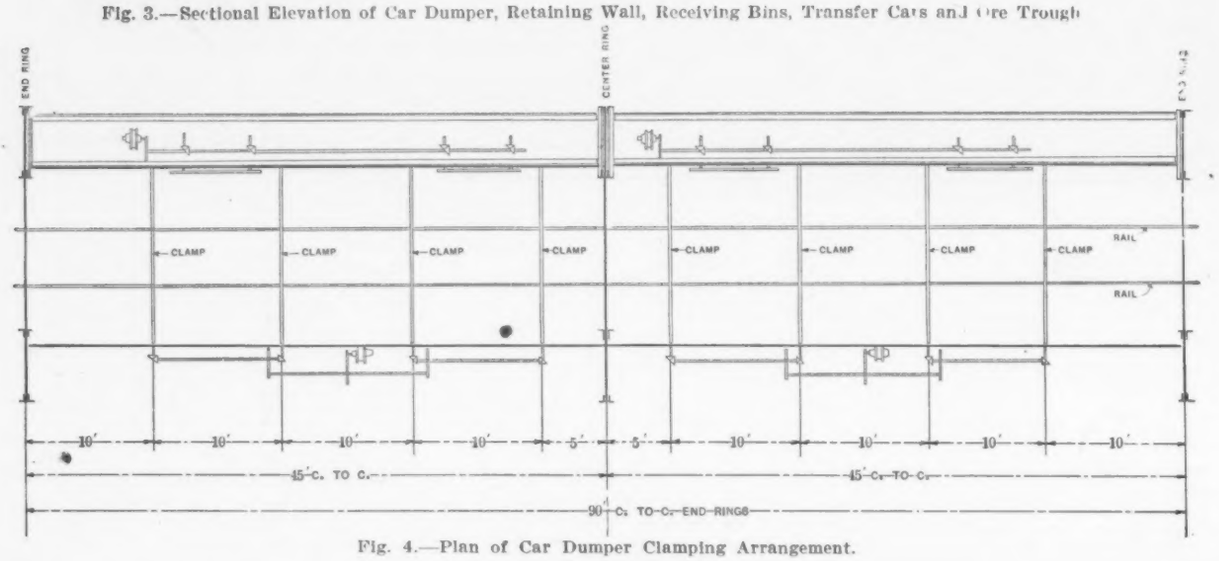


Fig. 4.—Plan of Car Dumper Clamping Arrangement.

of revolving the drums and thus rolling the dumper into a position over the bins in which the car is completely emptied of its contents.

The ore trains are switched to the track in line with the car dumper and two cars at a time are uncoupled at the foot of an incline leading to the dumper. The two cars are carried up the incline by an electric pusher car running on a narrow gauge track alongside. This car is provided with a steel pusher arm which is extended to engage the bumper of the rear car. The body of the pusher car is a substantial steel frame carrying a drum. One end of a steel cable wound on the drum is secured at the top and the other end at the foot of the narrow

gauge incline track. The travel of the pusher car and thus of the two ore cars is due to the revolution of the drum by means of various gears and pinions driven by a 60 hp. motor on the car. After the two cars in the dumper have been emptied and the dumper returned to its place, as referred to below, the empty cars are pushed out at the opposite end by the two full cars which are entering the dumper. The two empty cars run by gravity into the yard to be made up again into trains.

The operation of all the ore handling mechanism is electrical. The distance of the ore yard from other portions of the plant and the exposure to which pipes would be subjected precluded the employment of steam. Fig. 6 shows plainly the location and mounting of the four drums on which the car cables are wound in the rotation of the dumper. The drums are driven by a 100 hp. motor through a 3½ in. shaft and gears. The curvature of the track (Fig. 3) on which the four steel rings of the dumper travel is such that in the early part of the rolling movement gravity assists. At the middle portion of the shaft are carried four wheels with 12-in. face to which brakes are applied by compressed air. The brakes are applied at the end of the partial revolution of the dumper, and when the cars have been emptied the operator releases the brakes. No power is required for rolling the dumper back to its original position. In the latter portion of its travel, as it comes into the dumping position, the inclination of the track is upward. On the release of the brakes, gravity, with the later acceleration due to the counterweights, which are seen in Figs. 6 and 7, causes it to roll back. At intervals in the return the brakes are automatically applied by the action of a governor attached to the mechanism operating the drums, the speed thus being under control at all times.

The dumper itself without cars weighs about 300 tons. Its construction is shown quite clearly in Fig. 7. After the loaded cars are run into the dumper they are secured at the top by clamps and what will later be the under side of the car rests on supports, which are pushed in or out to suit the width of the car by means of motor driven screws. The top clamps are the riveted steel cross pieces shown plainly in Fig. 6. The clamps are operated by heavy screws through miter gears on short line shaft driven by motors. The screws for the side rests are also operated through shafting and miter gears. There are eight 7½ hp. motors, one to each top clamp, and two 10 hp. motors for the side rests. At present most of the coke brought to the furnace is dumped directly from the railroad cars into the furnace bins. Where the rack cars containing coke are put through the dumper, hooks are provided for holding the body of each car, as the heavy top clamps would crush the wooden racks.

From the car dumper the ore is discharged into receiving pockets carried by steel framework, as shown in Fig. 6. The capacity of the pockets is 350 tons of ore. They are equipped with the Hoover & Mason roller gates, which are rotating cylinders 5 ft. in diameter, set in the bottom of the bins. When actuated they form a sort of conveyor, carrying the ore out of the pocket and loosening up the ore above in the pocket. The rollers are revolved by a 10-hp. motor belted to the roller shaft. This motor runs continuously and the rollers are thrown into service as needed by a man on an intermediate platform, as seen in Fig. 6, this man pulling a rope which throws into action the friction pulley driving the roller on the bin he desires to empty. The starting rheostat for the 10-hp. motor is located on the ground and is started by the man who also acts as dispatcher for the transfer cars. On the upper platform, running in front of the drums which carry the car dumper cables, two men are required, as shown in Figs. 6 and 7, who by means of long bars completely clean out the railroad cars while they are in dumping position. This complete emptying of the car when in dumping position is a feature of the Hoover & Mason dumper.

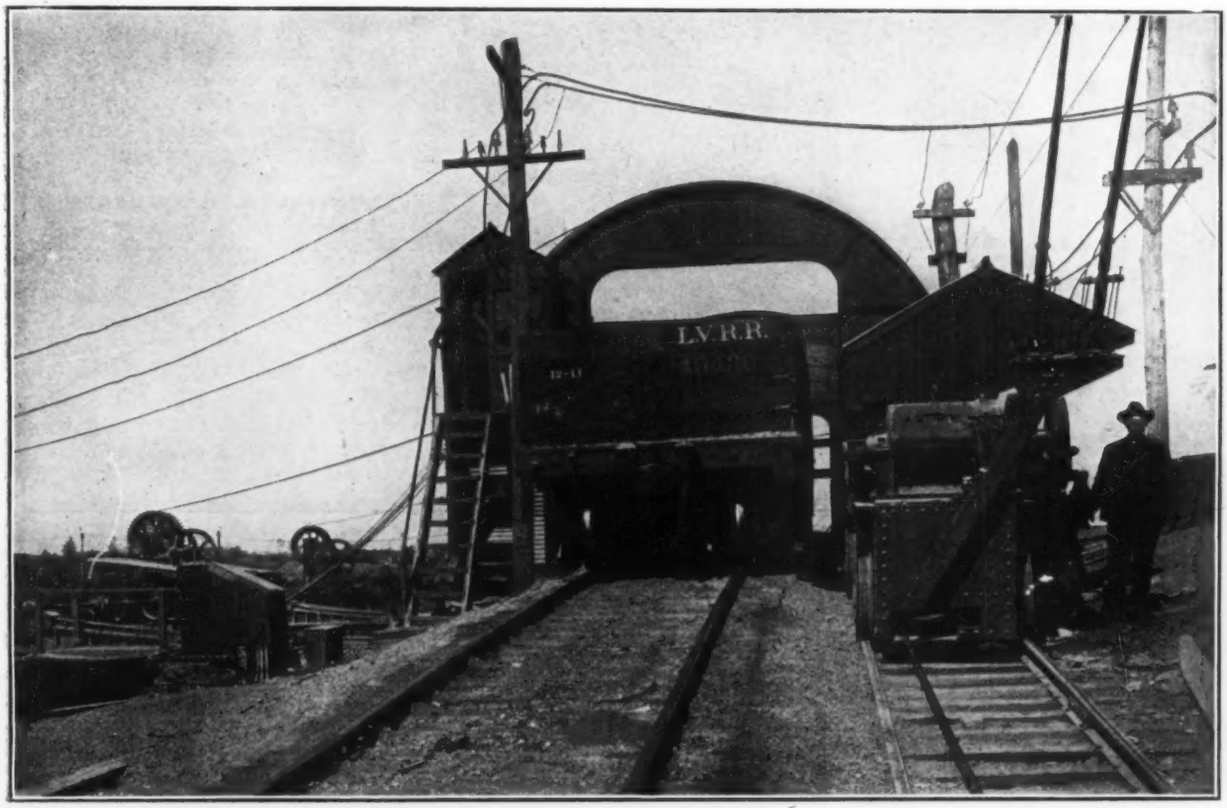


Fig. 5.—Electric Car Pushing Loaded Cars Into the Dumper.

The Bridge for Stocking Ore.

There is a choice between two immediate destinations for the ore after it passes through the dumper into the receiving pockets. It may be dropped into two-compartment transfer cars discharging from each side and taken direct to the furnace bins, or it may be unloaded into what is termed the local transfer car, which has a single incline bottom for discharge at one side, and deposited in the trough, as shown in section in Figs. 2 and 3. This trough, which is the preliminary storage place for the ore that goes on stock pile, is 400 ft. long. Its side walls are of concrete, 18 in. thick, and the bottom, which is rounded to conform to the shape of the grab bucket, is built of concrete strengthened with steel rails.

The ore bridge which is employed in stocking ore, or, when needed, in loading ore from stock piles into transfer cars, is 550 ft. long over all and 247 ft. center to center of towers. It is massively built, weighing 672 tons without cables, motors, grab bucket, &c. Each tower is mounted on a turntable, and one tower is equipped with longitudinal rollers to allow for endwise movement. The towers are supported on trucks traversing standard gauge tracks. For the travel of the bridge two 35-hp. motors are provided on each tower. The bridge is equipped with a 14-ton grab bucket, for the operation of which in lowering and hoisting, four motors of 75-hp. capacity each are provided. Two are designated as opening motors and two as closing motors. In lowering the open bucket only the opening motors are in service, and in raising the grab, after it has been closed by the other two motors, all four motors come into service in hoisting, one on each rope. The lowering mechanism for the grab is equipped with a special governor connected to pneumatic brakes, similar to the one on the car dumper described above. This keeps the lowering speed of the bucket under control. There are two 50-hp. motors for the bridge trolley traverse, which is at the rate of 1000 ft. a minute. The hoisting speed is 180 ft. a minute.

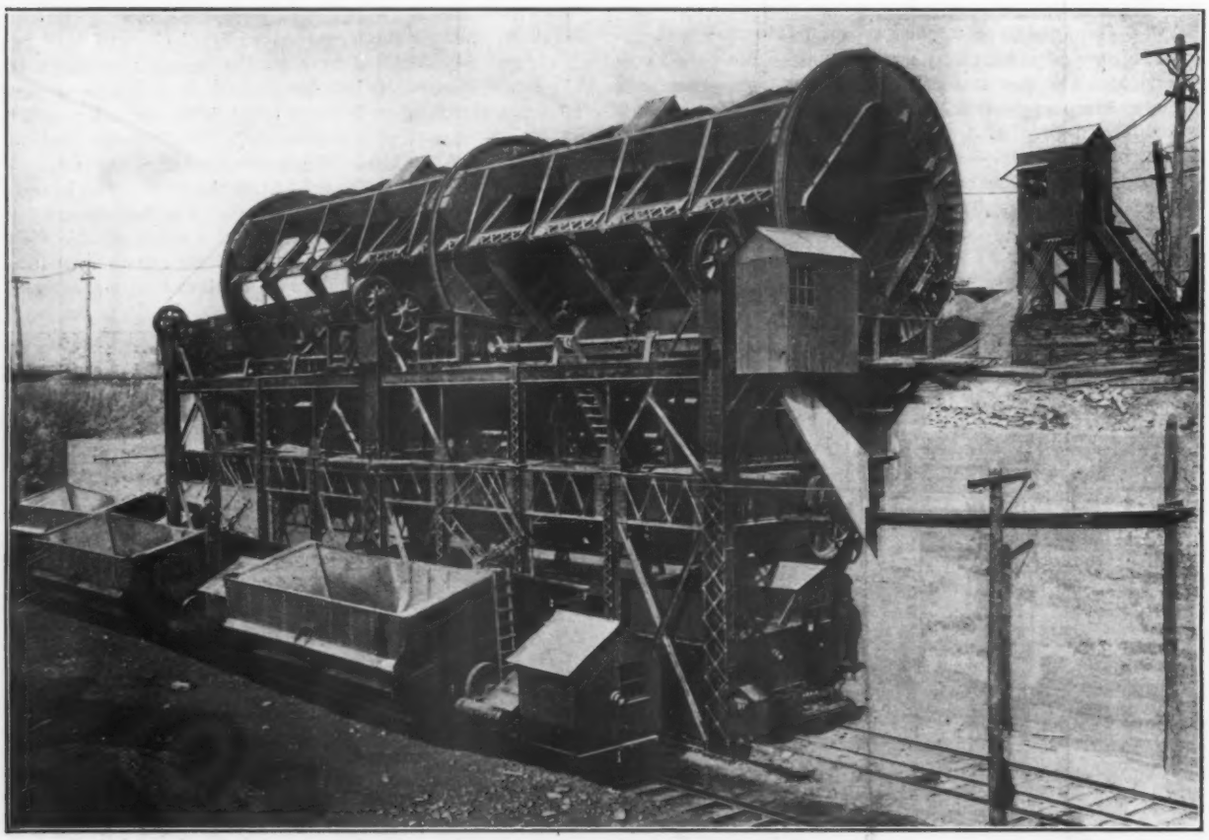


Fig. 6.—Car Dumper in Dumping Position Over Receiving Pockets. Transfer Cars Under Pockets. Empties Just Returned from Furnaces Are in Foreground.

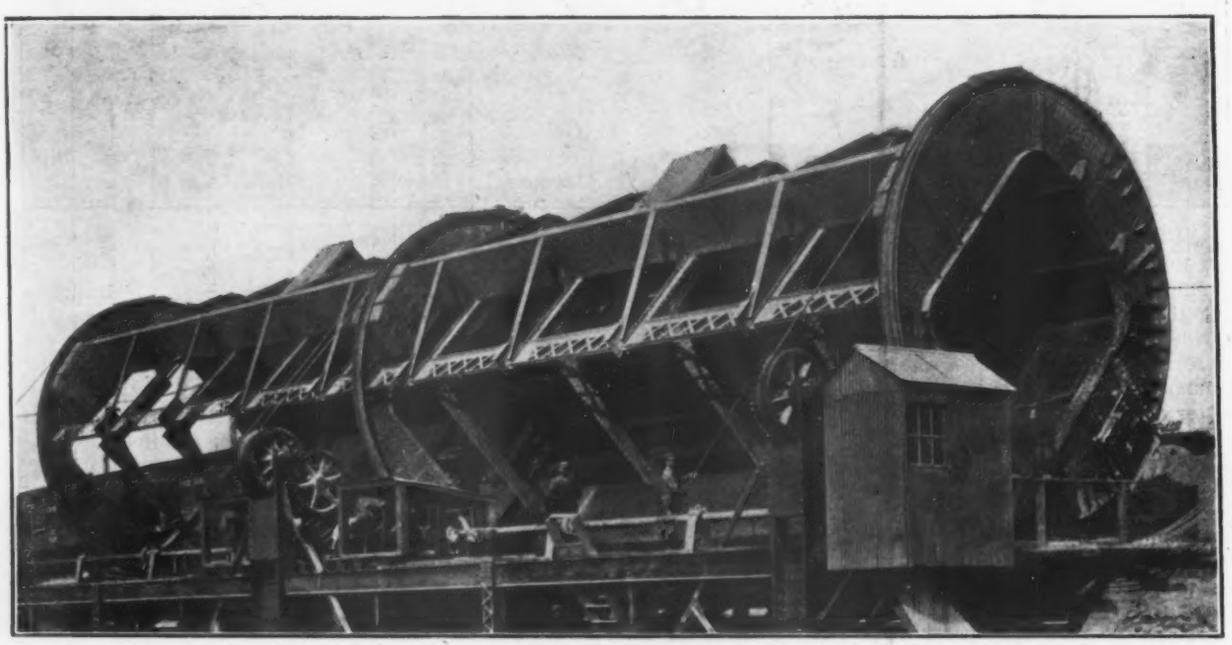


Fig. 7.—Enlarged View of Car Dumper. The Two Men on the Platform Completely Empty the Car by the Use of Long Bars.

It is interesting to note that the wall to the left in Fig. 1, which carries the track for one leg of the bridge, was built up by the dumping of slag from the blast furnaces. Care was taken to prevent the slag running over the sides, as the wall was built out, and men were stationed at the bottom who laid rows of lumps of slag

along both edges and extending into the unfilled space beyond the slag dump. The slag dumped between these low retaining walls filled in and cemented the lumps together, and in time a wide, stable retaining wall was constructed, running the entire length of the ore storage yard.

The transfer cars seen in Fig. 6, which take ore from the receiving pockets at the car dumper, or that receive stock pile ore through the grab bucket of the ore bridge, are of the Hoover & Mason type. The body of the car is 26 ft. long and 18 ft. wide. The opening of the doors for the discharge of ore is effected by gravity, while the doors are closed by a small motor. Four 35 hp. Westinghouse railway motors drive the car, which attains a speed of 20 miles an hour.

The Blast Furnace Bin System.

At the furnaces are four batteries of Hoover & Mason pockets, each battery with a capacity of 1000 tons of ore, 375 tons of limestone, and 500 tons of coke. These pockets are arranged in double rows, one side for ore and stone, and the other side for coke and material is unloaded from either of the two trestle tracks. The bins are built stronger on the ore and stone side. The pockets are all equipped with the Hoover & Mason rollers for the discharge of ore, coke and stone into scale cars running on tracks below, these cars in turn dropping the material into skips at the foot of the furnace incline. Some of the coke bin rollers are perforated for the separation of coke braize. The bin system, scale cars, &c., are after the now familiar design introduced at South Chicago. To provide against the freezing of the ore in the furnace bins in winter, chambers are provided on the ore side outside the sloping bin bottom, the construction being of sheet steel lined with concrete slabs. A fan blower in a central position with reference to the four ore bins draws hot waste gases from one of the nearby stacks and forces it through the chambers.

Every operation connected with the unloading, loading and storage of raw material, its transfer to the furnace pockets and its loading into scale cars and final delivery to the skip is performed by electric power.

The Schoen Steel Wheel Company's Steel Plant.

The Schoen Steel Wheel Company, Pittsburgh, is making some large additions to its plant at McKees Rocks, Pa. A steel building, 217 x 240 ft., has been placed under contract, to be erected by the Riter-Conley Mfg. Company, Pittsburgh, and to contain four 30-ton open hearth furnaces, which will be built from plans furnished by the Garrett-Cromwell Engineering Company, Cleveland, Ohio. It will be served by a 50-ton Shaw electric traveling crane, with 46 ft. 6 in. span; a complete industrial system for hauling ingots, &c., together with the most modern equipment used in open hearth practice. The ingot stripper will be served by a 10-ton Shaw electric crane, while the scrap yard will have two 5-ton cranes of the same make, which will be operated on runways adjoining the steel works. It has also been found necessary to make an extension to the No. 2 mill, consisting of an 83 x 115 ft. steel building, contract for which has been placed with the Riter-Conley Mfg. Company. When completed this will increase the present daily output of 375 to 450 wheels to 1000 wheels.

The demand for car wheels has been such that additional power equipment has also been required. The Babcock & Wilcox Company has been awarded a contract for one battery consisting of two boilers aggregating 508 hp. of its A and T type of boilers. This will be further increased later on. An order for 12 Forter-Miller gas producers has been placed with the Forter-Miller Engineering Company, Pittsburgh, which will make 15 gas producers of this type in the plant. In addition to these improvements, the installation of a slabbing mill is contemplated.

The Union Switch & Signal Company, one of the largest of the group of Westinghouse interests at Pittsburgh, reports a very satisfactory volume of business in the six months ending November 1. While none of the single orders have been equal in size to the contract from the Pennsylvania Railroad Company to install a signal system at its New York terminal station, they are well distributed over the various railroad systems of the country. This shows that the introduction of railroad safety and signaling devices is now being more generally made by the railroads than heretofore. In shipments, the company has for some time exceeded the best records of last year.

The Direct Casting of Ladle Linings.

A method of casting slag ladle linings, taking metal direct from the blast furnace, has been devised by Richard C. Veitch, master mechanic of the machine department of the Tennessee Coal, Iron & Railroad Company at Bessemer, Ala. It takes the place of the method of casting such linings in sections which are afterward bolted together and lowered into the ladle. Taking hot metal from the blast furnace for these linings and casting them in the ladle, it has been found, makes them more durable

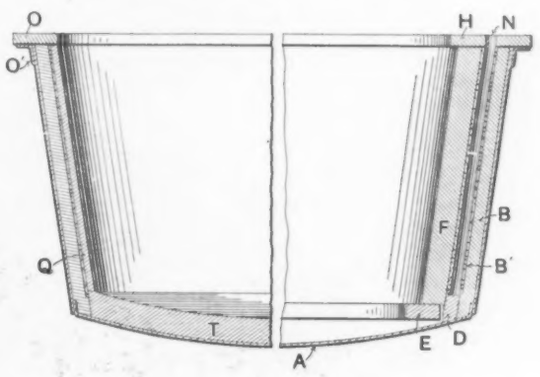


Fig. 1. Fig. 2.

Section Through Slag Ladle, Showing Method of Casting Lining

and satisfactory and reduces the cost of production. The process is made clear by the accompanying illustrations, of which Fig. 1 is a vertical section of the ladle with the lining cast therein, while Fig. 2 shows the mold in the ladle or hot pot in readiness to receive the molten metal forming the lining.

The ladle A is made of sheet steel and in the operation of casting the lining is held in a frame, being preferably mounted on a car, so that it may be moved from place to place. Brickwork, B, is laid up in the ladle, against its inner wall, and the inner surface of the brick is coated with loam, B^1. The metallic strip D is set on the bottom of the ladle inside of the layer of brick, its thickness being equal to the thickness it is desired to make the lining. A ring, E, is inserted inside the thickness strip, its circumference being in contact with the inner periphery of the strip and on E is built up a core of brickwork, F, the outer circumference of which is coated with loam. After the core has set it is lifted out of the ladle, together with the ring, and the uneven places in the outer circumference of the core are filled with loam. The core and the brick lining of the pot are thoroughly dried and a lining, T, of firebrick is placed in the bottom to fill the space formerly occupied by the thickness strip, and the core is again placed in the ladle, resting on the firebrick lining. A ring, H, with a slot, N, is temporarily held over the top of the core and the lining, the slot registering with the space left for the molten metal, which is to form the permanent lining. After the metal which has been run direct from the furnace has set, the core and the ring at the top of the ladle are removed and the permanent flange O is fastened by bolts to the annular flange O^1, which is secured to the shell of the ladle. The lining is thus held in place.

The process is controlled by the Furnace Hot Pot Lining Company, Brown-Marx Building, Birmingham, Ala.

The General Electric Centrifugal Air Compressor.

BY SANFORD A. MOSS.

After extensive experimenting during a number of years the General Electric Company, Schenectady, N. Y., is now producing a line of direct connected units for supplying air at moderate pressures in large quantities. These units are principally adapted for furnishing air blast to burn fuel, in oil, gas, or other furnaces, for various industrial purposes, such as hardening, soldering, annealing, melting, smelting, &c., and will find their widest application in machine shops, factories using gas and oil furnaces, gas works, copper smelters, iron foundries, brass foundries, blacksmith shops, &c. They are applicable to any cases where a comparatively large quantity of air is required at pressures from about 1 to 4 lb. per square inch. The machines are also arranged as exhausters for pressures within 3.25 lb. per square inch, or 6.5 in. of mercury below atmospheric pressure. They are not adapted for pressures less than 0.88 lb. per square

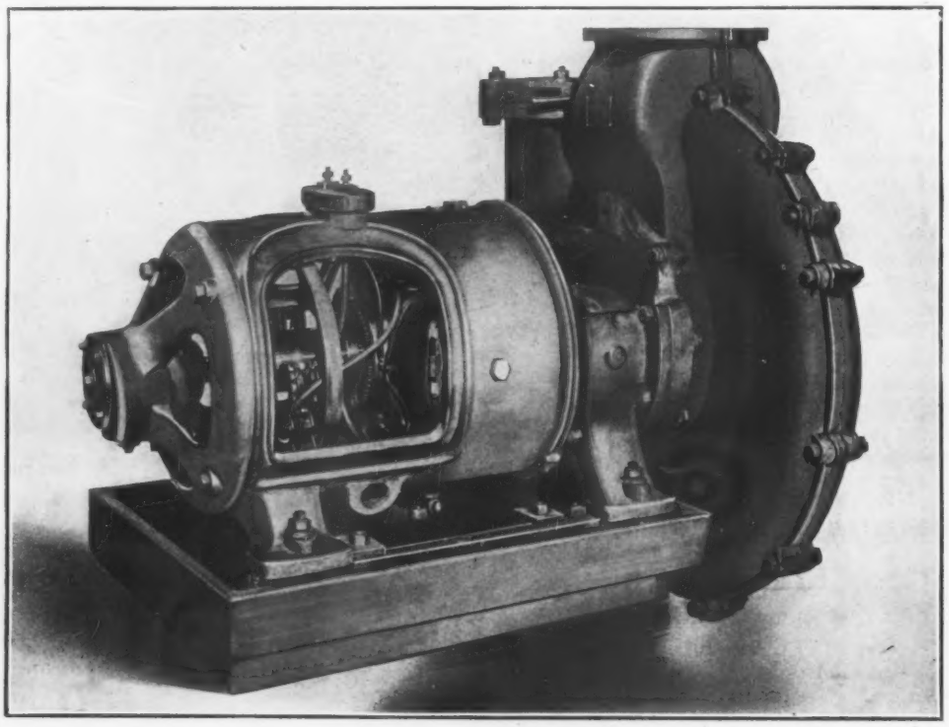


Fig. 1.—A 20-Hp. Direct Current Motor Driven Centrifugal Air Compressor Built by the General Electric Company. Capacity, 1400 Cu. Ft. per Min. at 1.7 Lb. per Sq. In. Pressure.

in., or 14 oz. per square inch, or 24 in. of water, or for ventilating work of any kind using 2 or 3 oz. or 2 or 3 in. of water. The ordinary fan blower should be used for such work.

The units, of which two examples are shown in Figs. 1 and 2, are much simpler, more efficient, more durable and easier to operate and maintain than high pressure fan blowers or positive pressure blowers, which have hitherto been used for such service. A number of machines have been in operation for long periods and are reported extremely satisfactory and much superior to the fan or positive pressure blowers which they replaced.

The units consist of a modified form of fan blower integral with the driver, which may be either an induction motor, a direct current motor or a steam turbine. Owing to the fact that the driver and centrifugal compressor are part of the same machine, a very harmonious and compact design has been possible. Speeds, &c., have been selected to give most efficient operation as a unit, and there has been no hampering from considerations of belt or gear drive, &c.

Design of the Compressor.

The centrifugal compressor consists simply of an impeller, similar to that of a fan blower, rotating in a case. The centrifugal compressor successfully accomplishes results much beyond the range of the fan blower and maintains pressure vastly greater. The machines are, in fact, what are often called turbine compressors, or turbine blowers, and are closely related to so-called turbine pumps. The present line of machines has but a single stage. (Multi-stage machines for greater pressures are in process of development.) The principal feature of the compressors is the design of the passages which conduct the air to and from the impeller, leading to the flanged inlet and discharge openings. This design is such as to maintain pressures and efficiencies much greater than heretofore obtained. The impellers are also of perfected design. They are symmetrical, receiving air on both sides so as to avoid end thrust. There is ample clearance between the impeller and the case, so as to avoid all possibility of rubbing.

The driver is furnished as an integral part of the apparatus, doing away with belting or gearing. The unit has two bearings and a single shaft, on which are mounted the impeller of the centrifugal compressor and the rotor of the driver. This is the only moving part. On sizes of 50 hp. and below the casings and frames carrying feet are bolted together. The larger sizes have a base or bed plate on which the frames, casings and bearings are mounted.

Ratings of Single Stage Compressors.

The following table gives a list of standard sizes, comprising a number of capacities for each of three pressures:

Table of Standard Sizes.

Service.	Rated pressure. Lbs. per sq. in.	Nominal capacity. Cu. ft. free air per min.	Diam. of discharge pipe. Inches.	Nominal hp.	Maximum pressure, D. C. or turbine drive. Lbs. per sq. in.
Foundry cupola or low pressure air blast..	0.88	2,600	12	20	1.5
	0.88	5,600	16	30	1.5
	0.88	7,000	20	50	1.25
	0.88	10,000	28	75	1.25
Moderate pressure air blast	1.7	750	8	11	3.7
	1.7	1,400	10	20	3.7
	1.7	2,000	12	30	3.7
	1.7	3,600	16	50	2.5
High pressure air blast	2.7	1,200	8	30	4.2
	2.7	2,400	12	50	4.2
	2.7	3,400	14	75	3.0

Any size may be driven by a 220-volt, 60-cycle, three-phase induction motor, a 125 or 250 volt direct current motor, or a noncondensing steam turbine, for any gauge pressure above 80 lb. per square inch. The starting characteristics of the induction motors can be made anything desirable. When required they can be especially arranged to start without exceeding full load current.

Special sizes and special air pressure may be arranged for under certain circumstances. With direct current motor drive the rated pressure is merely nominal and the pressure may be set by hand adjustment of the field rheostat up to the maximum value given.

The capacities given are based on measurements of quantity of air actually delivered under normal conditions. In comparing with positive pressure blowers it should be noted that rated capacity for a positive pressure blower is usually the computed displacement. The quantity of free air actually delivered is much less than the displacement of a positive pressure blower, owing to heating of air and drop of pressure while entering the machine as well as to leakage around the moving parts. Actual tests have shown a loss of 50 per cent. or more in capacity of a positive pressure blower. In usual cases centrifugal compressors will deliver as much air as a positive pressure blower with a rating 33 per cent. greater.

Large overloads may be put on centrifugal compressors in excess of the rated capacity at the expense of slight drop of pressure and of increased temperature rise of winding where an electric motor is the driver. The electric motors supplied have the usual moderate temperature rise of General Electric motors for rated capacities.

Centrifugal Compressors for Foundry Cupola Service.

The first four sizes on the list are normally arranged for supplying air blast to foundry cupolas. They may be arranged with a driver whose speed automatically varies with the load, either a direct current compound wound motor or a steam turbine with special governor. (Induction motors do not have this characteristic.) The pressure will then increase rapidly if the cupola chokes up, so that an opening is forced and normal conditions are restored. In this characteristic the centrifugal compressor resembles a positive pressure blower. This action is considered necessary by many foundrymen. In many cases, however, choking of the cupola never occurs, so that there is constant pressure even with a machine which would give pressure rise if load decreased due to choking. Hence a constant pressure machine is satisfactory in most instances. An actual capacity of about 375 cu. ft. of free air per minute is required for each ton per hour melted.

Centrifugal Compressors for Constant Pressure Air Blast, Gas Furnaces, &c.

All of the groups on the list are adapted for industrial air blast for various services, requiring constant pressure in the mains, whether low, moderate or high. For such service the apparatus is arranged with a constant speed driver, either a direct current shunt motor, a steam turbine or an induction motor. There is practically constant pressure independent of load, as shown by the curve, Fig. 3, and without waste of air at light loads through safety valves, or decrease of pressure for greater loads.

A positive pressure blower, when efficiently installed, has pulleys arranged to give normal pressure when the average number of furnaces is in use and with a safety valve just on the point of blowing off. If air is not required on any of the furnaces the normal amount of air must nevertheless be compressed to full pressure and the air not used blown off through the safety valve. If all furnaces are turned off, as occasionally occurs, the full amount of power is absorbed and all wasted. On the other hand, if a few more than the average number of furnaces are turned on the pressure in the main drops.

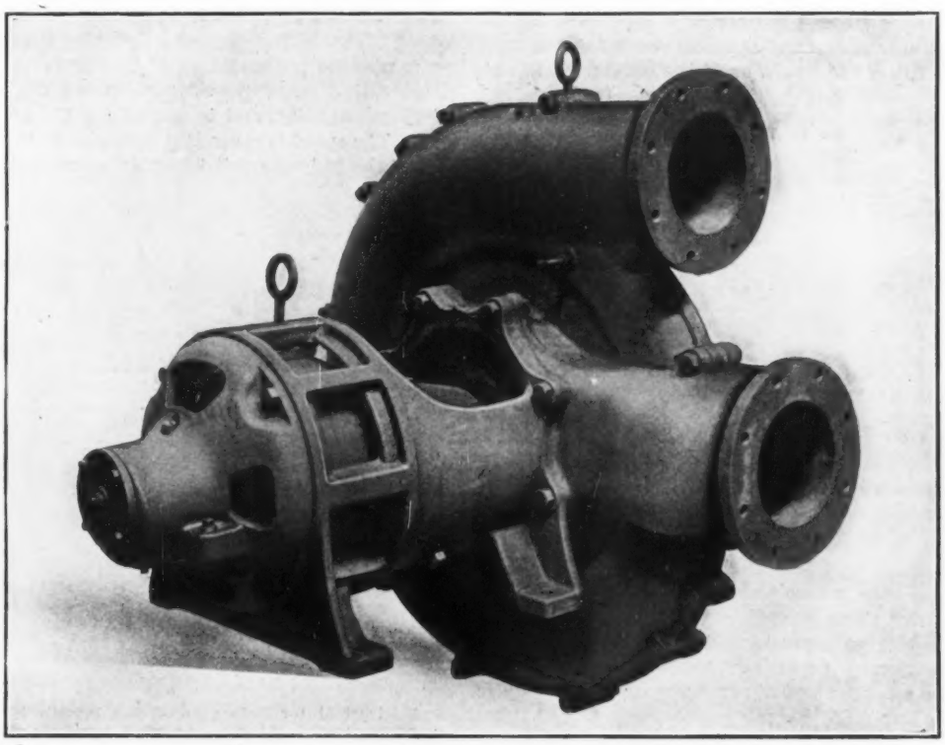


Fig. 2.—A General Electric 11-Hp. Induction Motor Driven Centrifugal Air Compressor. Capacity, 750 Cu. Ft. per Min. at $1^{7}/_{10}$ Lb. per Sq. In. Pressure.

This exceedingly inefficient performance is avoided with the centrifugal compressor, which gives practically constant pressure, regardless of the number of furnaces; that is, of the quantity of air being used. If furnaces are turned off the quantity of air passing through the compressor automatically decreases and the power input decreases correspondingly. If no air is being used the power input is a minimum and is only the small amount required to keep the machine rotating without load. This automatic regulation of pressure as load varies is accomplished solely by efficient design of the compressor, and no regulating devices, safety valves or other apparatus are used. At very light loads and heavy overloads the pressure is slightly lower than normal, but for all practical purposes the variation cannot be detected at the furnaces.

The standard centrifugal compressors are of such capacity as to permit the use of a single machine in a central location in a factory rather than a number of small blowers scattered in various places for gas furnace service. Even the smallest machines listed are too large for small gas furnace installations, only comparatively large installations being provided for.

Usual gas furnaces require air blast capacity of about

ten times the quantity of gas supplied. For ordinary gas or oil furnaces, the machines rated at 1.7 lb. per square inch pressure should be used. For furnaces requiring a concentrated or positively directed jet the machines rated at 2.7 lb. per square inch pressure should be used.

Pressure Characteristics.

As already stated, no pressure varying device, safety valve, &c., is required, and the pressure remains constant for all loads if a constant speed driver is used, or varies automatically for foundry cupola service. There is, therefore, no necessity for selecting pulleys of certain sizes or varying weights on safety valves. However, it is requisite that the desired pressure be properly selected in advance, as this pressure is a characteristic of the machine and is fixed when it leaves the factory. When a direct current motor is the driver, however, the pressure may be altered at any time through the field rheostat.

The rated pressures given are at the beginning of the pipe line and with free inlet. Allowance must be made for any pressure drop through the inlet supply pipe or drop in the main. All sizes are provided with an inlet pipe, which should be led to a cool place out of doors for most efficient operation. The pressures given are for an air supply at a temperature of about 60 degrees F. If the supply is hotter than this, or if the barometer is ab-

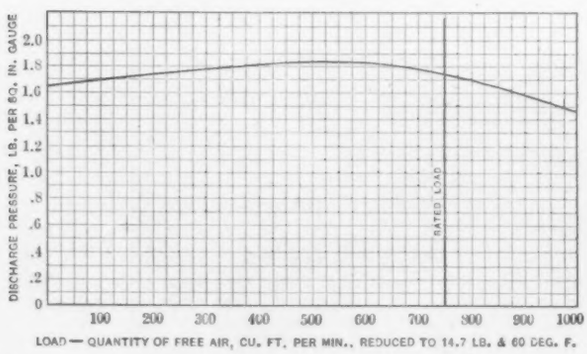


Fig. 3.—Pressure Curve of Centrifugal Compressor for Different Loads.

normally low, there will be a slight decrease of pressure. For an average case, where the inlet air is heated somewhat, and where there is sufficient length of inlet and discharge pipe to give appreciable drop, the three groups listed may be usually depended upon to give, at a distance from the machine, actual pressures in the mains of, respectively, about 0.625 lb. per square inch (10 oz. per square inch), 1.25 lb. per square inch and 2 lb. per square inch. Extremely small pipes would give lower pressures.

The centrifugal compressor delivers air at pressure without fluctuations such as occur due to intermittent action of a positive pressure blower. No tank is, therefore, necessary to steady the pressure, and the machine may be connected directly to the pipe line.

Constructional Advantages.

As already stated, the units are remarkably simple and the only moving parts are the rotor of the driver and the impeller, which are mounted on a single shaft and run in two bearings. These bearings have efficient lubrication and seldom require renewal. There are no other parts where wear can occur. The bearings are self-oiling, so that the only attention which the machine requires is renewal of the oil in the reservoirs at intervals.

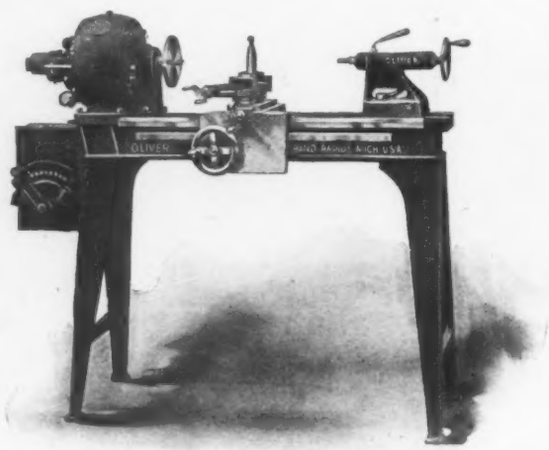
A number of machines have been in service for long periods without renewal or adjustment of any kind and without attention except monthly supply of oil. These machines have replaced positive pressure blowers very successfully. They have avoided the pressure variation, previously occurring as load varied, and the attention, oiling and frequent repairs previously necessary to keep the positive pressure blowers in good order. In these installations the valve in the discharge pipe may be opened or closed, putting on or off full factory load, without appreciable pressure variation or waste of air.

There is no possibility of wear in the centrifugal compressor, so that the efficiency and capacity always remain unaltered. Actual tests of machines after long service confirm this. In this respect the apparatus is superior to the positive pressure blower, which has rubbing surfaces that soon wear, so as to cause leakage and decrease of efficiency and capacity. As already stated, actual tests of positive pressure blowers have shown a loss of 50 per cent. in capacity from measured displacement.

The Oliver Motor-Head Pattern Lathe.

Generally speaking, independent motor drives are found in shop practice to be more practical and economical when applied to large than to small machines. But that individual motors may be advantageously used on small tools is evidenced by their successful employment in many cases. Such an example is shown in the illustration herewith, which represents the motor-head speed lathe made by the Oliver Machinery Company, Grand Rapids, Mich. This tool, although adapted to wood turning in general, is especially designed for work in pattern making shops.

As will be noted in the illustration herewith, the headstock consists of a small motor, the armature shaft of which is extended to serve as the lathe spindle. As in the ordinary cone pulley lathes of like pattern, the spindle is fitted with a screw thread for a face plate. The motor is of ½-hp. capacity, and is wound for 110 or 220 volt current. The speed is controlled by a rheostat attached to the end of the bed, where it is within easy reach of the opera-



A Direct Motor Driven Speed Lathe Built by the Oliver Machinery Company, Grand Rapids, Mich.

tor. A hand feeding carriage fitted with either a plain or a graduated swivel, or a compound rest with traverse movement, is supplied when desired.

A feature of convenience is to be observed in the flat top of the bed, which provides a convenient rest for hand tools. The inside edges are machined and form the alignment ways for the headstock. The tail stock, which is of the usual pattern, is provided with a set-over device for taper turning when so ordered. The length over all is 55 in. and the swing over the bed is 12 in. The speed may be regulated from 700 to 2100 rev. per min.

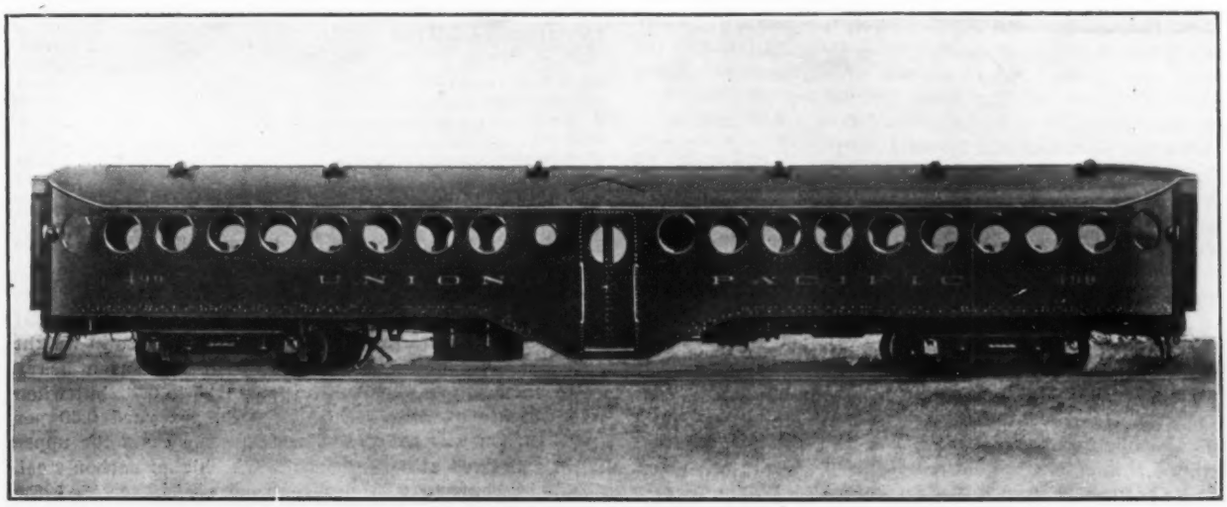
The elimination of belts and overhead transmission makes this tool particularly desirable in crowded shops and does away with the annoyance of broken belts and other troubles incident to their use. This lathe is regarded with especial favor by manual training schools, as is evidenced by the fact that quite a number of such institutions have been recently equipped with them. Eighteen of the type here illustrated were purchased by the Pennsylvania Railroad Company and donated to the Public High School of Altoona, Pa.

The Pottstown Iron Company, Pottstown, Pa., has reopened and is now working its old Hopewell mine which was abandoned some time ago, and two carloads of ore a day are being shipped to the company's plant at Pottstown.

A New All-Steel Passenger Coach.

An entirely new type of passenger coach, the principal purpose of which is to increase the protection of passengers and trainmen, has been designed by the Union Pacific Railroad Company, and constructed at its Omaha shops. It is entirely of steel outside and fireproof material inside, except for about 200 lb. of wood filling blocks. The length over vestibule diaphragms 68 ft., is the same as the present standard, 60-ft. coach, but the hight from rail to roof has been decreased 24 in., and the form is radically different from the familiar old style passenger car.

The under framing is composed of two 12-in. I-beam center sills, 16-in. centers and 6 x 3½-in. angle iron side sills, all securely fastened by cross ties, needle beams and diagonal bracing, forming an ideal construction for strength and durability. The center sills are intended chiefly for taking the buffing and pulling stresses, and do not carry any load since they themselves are carried by the sides of the car, which are of girder formation as described later. At each end is a one-piece steel casting 11 ft. long by 9 ft. 9 in. wide, weighing 3700 lb., which combines the double body bolster, end sill and end bracing of the under frame. This cast steel end greatly reduces the number of parts, and the time required in making an end of structural design.



The Union Pacific Railroad Company's New Type of All-Steel Passenger Coach.

On top of the under framing are placed a course of 1-16 in. sheet steel, forming a fire protection from below, a layer of ¾-in. hair felt, and finally a flooring of fireproof composition ⅛ in. thick, laid on ¾ x 2 in. nailing strips embedded in the hair felt. The side posts and car lines are continuous 3-in. channels bent in inverted U form with flat sides outward, extending from one side sill to the other. These are riveted and braced to the side sills and to longitudinal 4-in. channels, where they curve to form the roof. The ⅛-in. steel side sheathing is riveted to this framework, forming deep substantial girders. The roof sheathing is 1-16 in. thick.

Holes in the side sheathing accommodate the frames for the circular aluminum window sashes. The panes are 24 in. in diameter, and the sashes are seated against half round rubber gaskets, to make the windows weather and dustproof. The windows are hinged at the top, and may be swung upward to the ceiling and secured by a special catch. Pantasote curtains may be drawn over the windows when closed. The usual deck sashes and upper deck have been omitted, the roof being a plain half oval. This design has been used on all of the gasoline motor cars built by the railroad company, and is light, strong, simple and cheap to construct.

The interior arrangement differs most widely from any present coach. In place of two end vestibules with four entrances there is a single vestibule at the center with an entrance on each side. Both ends of the coach are rounded to lessen wind resistance, and the usual end doors have been retained to allow a continuous passage through the train. The two toilets are placed at diagonally opposite sides of the steps at the center of car, and are well ventilated.

All the partitions and inside walls of the car are ¼ in. thick, and the ceiling ⅛ in. thick; both are of the same fireproof composition as the floor. The total thickness of the walls is only 2 in., or 3½ in. less than in an ordinary wooden coach, allowing an increase of 7 in. in the width of the aisle.

An excellent system of ventilation is provided. Cottier suction ventilators are placed along each side of the center of the roof, and 12-in. fresh air inlets at the four corners of the car about 8 ft. from the rail. The latter are covered with fine brass netting, and the admitted air passes downward to a sheet iron box beneath the car which contains two sets of removable dust collecting screens. The air is discharged upward inside the car, along the sides from a sheet iron duct having perforations at each seat. The fresh air ducts contain steam pipes, which heat the air in transit. Dampers in the intakes control the amount of air admitted. Electric lights on the ceiling and between the windows receive current from an axle driven generator in connection with a storage battery.

Following are the principal data regarding the weight, dimensions, &c., of the coach:

Actual weight	89,300 lb.
Length over diaphrams	68 ft.
Hight, rail to roof	12 ft. 1¾ in.
Hight, floor to ceiling	7 ft. 8¼ in.
Width, inside at wainscot	9 ft. 5⅝ in.
Width of aisle between seats	3 ft. 5⅜ in.
Width of car over side sills	9 ft. 5⅜ in.
Seating capacity	78

This coach is lighter than any all-steel coach, with an equal seating capacity or length, ever built. It shows a weight per passenger of only 1145 lb., 205 lb. lighter than the lightest steel coach previously built.

The above information is supplied by W. R. McKeon, Jr., superintendent of motive power and machinery, under whose personal supervision the coach was designed and built.

The Indiana Appellate Court has handed down a decision that the factory act of that State does not absolutely require all elevators to be equipped with safety devices, without reference to whether the factory inspector has ordered them. An instruction to a jury that the failure to provide safety devices necessarily made the employer liable, if the elevator fell and injured a workman, is held erroneous. The act, however, requires employers to use safety appliances when the factory inspector decides them necessary and orders them used.

There has been a pronounced falling off in applications for Pennsylvania State charters in the last 60 days. Dullness in business is given as the cause. This year's incorporations, however, will run close to the record of 1906.

Rail Mill Practice and Rail Service*.

The Question Discussed from the Manufacturer's Standpoint.

BY FRANKLIN E. ABBOTT.

[In the early portion of the paper the sources of ore supply, mining methods and the process of steel making are gone into, preliminary to the explanation of rolling mill operations.—EDITOR.]

When the ingot is turned down on its side for the first time, it enters the blooming rolls. The first two passes are through two separate sets of rolls of large diameter, operated by powerful engines. The motion is slow, and the reduction heavy. It then moves forward to the next set of rolls, where four passes are made and a bloom about 8 x 8 in., 20 to 22 ft. long is completed. In these shapes, the size of the bar is reduced sufficiently so that the ends can be sheared off. Enough metal is cut from the end coming from the top of the ingot to remove all traces of piping or spongy steel, and also removes the part containing greatest amount of segregation. From the other end, coming from the bottom of the ingot, enough is cut off to make the end face square and solid. After the shearing, the bloom is conveyed to the roughing rolls where in four passes a rough form of the rail section is worked out. From there the bar goes to the finishing rolls, making four more passes, thence is moved sidewise across the mill floor to the last finishing pass, where the rail section is finally completed to the minute refinement of its detailed dimensions.

The block of steel which started at the other end of the mill, about 18 in. square and 50 in. long, has now become a rail with a sectional area 6 or 7 sq. in. and 175 ft. in length. All this change has been made in an interval of eight to nine minutes. In a two-high mill, such as the one referred to in this paper, the ingot is continued throughout the entire rolling process in one piece, and finally a single length is furnished equal to four or five 33-ft. rails. The long rail is carried from the last finishing pass to the hot saw, where it is cut into standard lengths, according to order, cutting one rail at a time, thence through the cambering rolls to the cooling beds, where the rails are left till brought to the temperature of the atmosphere or about 70 degrees.

Cambering.

In passing through the cambering rolls the rails are forced into a curvature with the head arching upwardly. That is to say, if the rail, immediately after coming out of these rolls, were made to rest on its base, or in the trackman's parlance, "work ways," the ends would be low. From this shape it warps first to the opposite curvature, bringing the ends high, then back toward the first shape, and finally drawing back again in the final cooling, leaving the rail when resting freely on its base, with a back sweep or the ends up. The effort on part of the mill superintendent is to regulate the cambering so that the rails will cool as nearly straight as practicable, but as absolute straightness is almost impossible to attain, they are preferably brought, when cold, to a slight back sweep as already described.

There are two reasons for having rails at their normally cold temperature with back sweep rather than head sweep, if they do not come out perfectly straight. 1. The cold straightening work will be done mainly on the base, thereby escaping the danger of indentations from gagging iron on the running surface of the head. 2. The internal stresses left in the rail when it becomes cold, tending to draw the ends upward, even after it is cold straightened, will help to hold the joints up and maintain better track surface when the rails are put into use. The rails pass from the cooling beds over live rolls, by which they are distributed to the presses where they are straightened, drilled, finished and inspected; thence they are carried down through the mill to the loading sheds and finally loaded on cars.

The Chemistry of Rail Steel.

It may be of interest to return to some points along the process of rail making where greatest difficulties are encountered, and also cite some of the articles in standard specifications that are a source of more or less contention between the makers and users. One such article is that covering chemical compound. When the spiegeleisen is poured into the purified iron in the vessel just after the blow, necessary ingredients are introduced to make it hard, elastic and ductile. Chemical analyses of average Bessemer rail steel as made at present for heavy rails run about as follows:

	Per cent.
Carbon	0.50
Phosphorus	0.10
Sulphur	0.08
Silicon	0.12
Manganese	1.00
Iron	98.20
Total	100.00

The quantity of carbon can be controlled by the grade of spiegel used. The makers and users of rails are not exactly agreed as to what the limits in carbon should be. The users have been inclined to increase carbon content somewhat faster in proportion than the increase in weight of rails. When a 70-lb. rail was regarded as a heavy section, carbon in the steel ran from 0.35 to 0.40, but when the weights of rails reached 100 lb. per yard 0.60 per cent. carbon was called for, and in some cases the upper limit was fixed at 0.65 per cent. The higher carbon steel, 0.55 per cent. to 0.65 per cent., was also specified for lighter rails such as 80-lb. and 85-lb. per yard. The 80-lb. rail was an increase in weight of only about 14 per cent. over the 70-lb., but 0.58 per cent. carbon often called for in this weight rail was an increase of fully 45 per cent. of this element over the lighter section. It can be seen that hardening properties were raised entirely out of proportion with the increased weight, and the apparent consequence was a less satisfactory rail in the heavier section.

THE RELATION OF CARBON AND PHOSPHORUS.

The reason for raising the carbon was to get more elasticity and better wear, which in a degree was obtained, but with it came more failures from breakage. It was then proposed and specified on part of the users that phosphorus should be lowered about 15 per cent., making the limit not to exceed 0.085 per cent. This proposition seemed entirely consistent from a metallurgical and theoretical standpoint, but practically it cannot be obtained because of the ore conditions. It is estimated that the available low phosphorus Bessemer ores in the United States are relatively small.

If all the rail mills in this country were to undertake to fill, from American ores, the annual requirement of about 3,000,000 tons under 0.085 phosphorus specifications for Bessemer rail steel, that grade of ore would be exhausted before provisions could be made to meet the yearly demand for rails made by any other process. If open hearth steel is to succeed Bessemer, it will take a term of years and the expenditure of an enormous sum of money to build furnaces enough to provide the steel needed for rails alone. Before this could be accomplished it is more than probable that the low phosphorus Bessemer ores from which steel 0.085 in phosphorus could be made would run out, and with an inadequate production of open hearth steel, the railroads would have to either get along with a short supply or import the tonnage lacking. In the event of such sources not being able to keep pace with the demands, their only alternative would be to take a grade of Bessemer steel far inferior in wearing qualities to what they are now getting.

* From a paper read before the Central Railway Club, Buffalo, N. Y., November 8, 1907. Mr. Abbott is connected with the Lackawanna Steel Company and was a member of the joint committee of the American Railway Association and the steel companies.

To avoid this apparent short cut to the end of good quality Bessemer rail steel, the makers insist that the phosphorus limit shall be left as it has been for a number of years past, at 0.10 per cent., and a somewhat modified carbon content be used. It is entirely practicable to use enough carbon with 0.10 per cent. phosphorus ores to make perfectly sound, safe and serviceable Bessemer steel, and with that limit accepted, the manufacturers will be able to produce good quality Bessemer steel rails for many years to come. The wear of the heavier section rails has not been all that the users expected, even with the proportionately higher carbon, and they are loath to make any recession in this hardening element, fearing that by so doing there will still be greater loss from rapid wear. But the question of safety must have first consideration, and neither the makers nor users of rails will be justified in adding hardening properties, to get increased service, that will place the material anywhere near the danger line of breakage.

So the question of carbon and phosphorus content that shall be used in Bessemer steel for rails is not fully and definitely settled. The phosphorus limit is substantially fixed by conditions. The carbon limit to correspond is likely to be fixed by more experience. There is a strong probability, however, that harder steel may be used if the shape of the rails is changed. How this may be brought about will be considered further on.

SULPHUR, SILICON AND MANGANESE.

The next element in order in the steel composition is sulphur. This is of little consequence to the user of rails. Its effect is to make hot steel dry, or what is called "hot short," and liable to pull apart, making flaws on the surface of rolled shapes. A limit of 0.10 per cent. can be handled very well, but it is always to the interest of the manufacturer that it should be lower.

Silicon has a quieting influence in molten steel when it is settling and cooling in the molds and makes it dense when cold. A limit of 0.20 per cent. is generally stated in specifications.

The quantity of manganese in rail steel will run from 0.80 per cent. to 1.10 per cent. Its effect is to make the hot steel tougher, overcoming some of the bad effects of sulphur, and thereby better adapted to rolling. It also makes the steel harder and better for wear, but if the quantity exceeds very much the upper limit noted it is liable to lead to brittleness.

The Amount of Discard.

Another clause in standard rail specifications that is a source of some contention between makers and buyers of rails reads as follows: "Sufficient material shall be discarded from the top of the ingot to insure sound rails." Under that agreement the buyers of rails can get, and do get, perfectly sound steel. The term "sound" in this case means entirely free from piping or spongy metal. Sound steel rails of standard composition are perfectly safe to use, and when the railroad companies have exercised their rights given by the specifications in their inspection at the mills, while rails are being made, and thereby obtained sound rails, they have done their whole duty toward themselves and their patrons, whose safety and welfare they are bound to protect.

But the question arises, Why do the railroad people, or so many of them, come up with a demand for more discard, in some instances asking for a fixed amount not less than 25 per cent. of the whole ingot? It is not a question of safety but one of service. Under present specification the rail mills must deliver to the railroads safe rails, that is to say, free from the danger that comes from piping. They are obtained by shearing from the top of the ingot sufficient material to insure sound steel.

Then what would the railroads gain by doubling the discard if 25 per cent. should amount to that increase? They might get a larger percentage of better wearing rails than they now receive, but the gain would be purely in an economical sense, and not in one of safety. Therefore, the question of more discard after enough has been made to insure sound and safe rails is purely a commercial one, and can be disposed of between the railroads and the steel companies without giving cause for any anxiety on the part of the traveling public.

The Drop Test.

In addition to the discard sheared off the bloom, a crop end is cut off the long rail when it is finished, taken from the end toward the top of the ingot. This is about 6 ft. long and is used for a drop test. One such test piece is taken from every blow of steel. It is placed on steel wedge shaped bearings, 3 to 4 ft. apart, and struck with a 2000-lb. weight falling 15 to 22 ft. (depending on the size of rail tested). The deflection of the test piece under this drop is carefully noted and made a part of the inspection records. If the test piece breaks under the drop all rails from the blow represented by that test must be discarded.

This is the most satisfactory proof of the quality and strength of the rails that can be used. If the steel is brittle, it will be discovered by the character of the break. If piped, that condition can be seen in the fracture and will determine at once whether or not sufficient discard has been made at the shears to insure sound steel. If the metal is very soft it will show by excessive deflection. It can be seen, therefore, that the drop test throws out many safeguards against passing defective or inferior material.

Rail Sections Not Simple.

Another difficult part in the making of steel rails is in the section. In the first place, it has to be very close to mathematically correct. A finished rail is a simple looking thing when it is made, but there are a good many dimensions besides the length to take into account in getting it through the mill in proper shape. The ordinary rail section is made up of 17 separate and distinct dimensions, nine of which are duplicated, making a total of 26 to be kept in order and held in their respective places when the rolling is under way.

The section is continually checked during the process of rolling. This is done by a steel template made to exact dimensions of one-half the rail divided by its vertical axes. The rail section is tested on both sides by the same template, and therefore each half is as nearly like the other as possible to make it. In checking rail sections the inspector has to guard against either over or under size and always strives to maintain perfect symmetry. In this detail a difference of 1-64 in. cannot be ignored, and the wonder is how such ponderous and coarse machinery as constitutes a rolling mill can be so nicely adjusted as to accomplish such fine results. It is not easily done, and it should be remembered that the turning or shaping of rolls and the manipulation of steel through them when rolling is under way is the most intricate part of the rail making process.

The history of the T rail section from its origin to the present time, as we now have it, makes a very interesting story, but rather too long to include in this paper. It is of interest, however, to note how closely in shape the T rails at the present time are to those first made for use in this country.

In 1830 Robert L. Stevens, president and chief engineer of the Camden & Amboy Railroad, received orders to visit England to inspect and report upon railroad matters there. He was directed to purchase all iron rails. It should be noted that previous to this time rails had been made largely of a combination of wood and iron, and the inference is that instructions to purchase all iron meant that the rails should be made of one piece and one material, and that should be iron.

It was during this voyage that Mr. Stevens designed the first rail ever rolled with a base. He whittled several model sections out of wood, which he obtained from the ship's carpenter. The shape finally taken was in general outline similar to the present rail, having a head about 2 in. wide, a base 3 in. wide, and a hight of 3½ in. Rails of this general type of various weights were made for the next 30 years or more. After the Civil War, when practically all the railroads then in existence had to be rebuilt and new ones became necessary, the tee rail section was improved in detail, and in 1874 sections were brought out almost identical with many still in use. During the next 15 years rail sections in great varieties of dimension were produced. Nearly every railroad had its own design, and it is stated that one rolling mill, at a certain time during this period, in undertaking to sup-

ply its customers with such as were called for, had to provide rolls for 119 different patterns.

The A. S. C. E. Sections.

The inconvenience and heavy cost to both manufacturer and users of rails in having so many different sections led up to an effort toward adapting a series of what could be regarded as standard shapes. This task was undertaken some time in 1888 or 1889 by a committee appointed by the American Society of Civil Engineers. The work was taken up cautiously and met with a good deal of interference. But the committee persevered, and in course of three or four years brought out what is now known as the A. S. C. E. sections, which give a series of shapes varying by 5 lb. per yard from 50 lb. to 100 lb. Notwithstanding the fact that some engineers have always criticized these sections, and many roads would never accept them for use, still the widespread advantage to be gained in having standard shapes led to their rapid adoption, and within 10 years from the time they were introduced fully 70 per cent. of all the rails rolled for American railroads were made of these patterns. At the present time, the proportion has increased to over 75 per cent. One of the leading advantages to the manufacturer in the A S. C. E. sections is in the distribution of metal in its different members:

	Per cent.
In the head there is	42
In the web	21
In the base	37
Total	100

There are but five points difference between head and base, and these being so much closer than many of the sections the mills were formerly required to make, they gave the A. S. C. E. sections a cordial welcome and have always tried to further their use. At the time these patterns were designed and introduced an 80-lb. rail was regarded as a heavy section, and some engineers even doubted whether one so heavy could be used economically. The designers, however, evidently expected railroad track to grow, for they provided for 5 lb. per yard increase in weight till 100 lb. was reached, and then designed a 110-lb. pattern, apparently for a good measure. The period during which the 80-lb. rail was regarded as heavy was not of long duration, for the railroad soon took on 85 lb. and 90 lb. sections and during the past few years a very considerable tonnage of 100-lb. rails have been made.

The Shrinkage Clause.

The 90-lb. rail was an increase of about 12½ per cent. and the 100-lb. about 25 per cent. over the 80-lb. The users of rails naturally looked for a proportionate gain in wear for the additional steel bought. But this did not always obtain and led to the criticism that they were not properly worked; that they were rolled too fast and finished too hot. An effort was then made to incorporate in standard specifications what was called a "shrinkage clause." By this is meant that the rails when they reach the hot saw shall be at such reduced temperature that only a certain number of inches and fractions of an inch shall be allowed for the rail to contract in length from the temperature at the sawing down to 70 degrees. It was expected that if the mills could comply with this, the steel would come through the finishing passes at a lower temperature, and the colder rolled steel would give better wear.

It would be perfectly reasonable to look for those results from such conditions. But the difficulty of incorporating a shrinkage clause in general specifications and making it operative was found in the fact that rails cannot be brought to the hot saws at the same temperature in every mill. There are no two in which the shrinkage could be kept exactly alike, therefore any fixed allowance in a general specification could not be made applicable in all places. The opposition to a definite shrinkage clause in specifications is raised on account of the insurmountable difficulties encountered in attempting to fix a temperature at which the finishing work shall be done in unbalanced sections.

As already stated, the A. S. C. E. section, or any other T rail thus far made, has greater percentage of metal in the head than in the base. The head is in a mass with less radiating surface than the base. The base is not only smaller but thinner, besides having a greater radiating surface. It can, therefore, be readily understood why there is considerable difference in temperature between head and base, when the rail goes through the finishing passes. The object of a shrinkage clause was to improve the rail head by finishing at a lower temperature, but in an unbalanced section the base is likely to get too cold to work, or so hard as to cause danger of breaking the rolls, while the head may still be hot enough to admit of some reductions. The impossibility of obtaining all that might be desirable from colder rolling in such shapes is quite apparent.

Cold Straightening.

Cambering of the rails is made necessary to counteract the warping that takes place in cooling. The warping is due mainly to the shape of the section, and the rail is rarely perfectly straight when cold. Whatever warp or crook may be left in must be taken out by cold straightening. This is done in a press under a slow motion plunger by applying pressure on the rail centrally between bearings 42 in. apart. The arrangement of this press has lately become part of a general specification, and for that reason should receive some notice in this connection.

It is pretty generally conceded by both rail makers and users that the strain and torture that rails have to endure in cold straightening are the most severe and most objectionable work in the whole manufacturing and finishing process. The impossibility of taking a bend or kink out of a rail without straining it beyond its sectional elastic limit makes the necessity of setting up internal stresses, working at cross purposes with the normally cold tension of the steel, unavoidable. To what extent these may be harmful to the rail after it is put into service cannot be definitely determined, but it is only reasonable to infer that they have some effect. The remaining work in finishing after the straightening is done consists of drilling, chipping, filing, &c., all simple mechanical or hand operations not likely to cause any injury.

The final action on the part of the railmaker with the intention of turning over to the railroad material sound and in good order, is to see that it is properly loaded, so that in unloading there will not be danger of undoing any of the finishing work accomplished with so much painstaking effort at the mill.

The Rail in Service.

At this point we pass to the third step, namely, how rails are used. The way rails are used, and what happens when they are used, is so well known and understood by all men in any way associated with railroad business that it would seem hardly possible to say anything new on this part of our subject. But rail wear, or more particularly rail failure, which at various times has caused considerable general comment, necessarily occurs when they are in use and are of sufficient importance to arrest attention. Therefore, the use of rails, how they are treated, and what takes place under such treatment, should be studied and better understood.

When a rail goes into track it is placed on a series of wooden bearings, usually about 22 in. centers, and fastened at the end to adjoining rails laid in the same way. The wooden bearings rest on broken stone or gravel, and these in turn are carried on the natural earth of the railroad bank or cut, as the case may be, consisting of any grade material from light dry sand to heavy wet clay, and may be solid or unstable, depending on drainage and other local conditions. Thus we see that a railroad track is constructed somewhat in reverse order from other structures built to carry loads. That is to say, the steel rails, the strongest and most permanent member of the construction, is at the top, while the soft earth or wet clay, the least stable part, is at the bottom.

The rail in service has been compared with a bridge and referred to as a continuous girder, which should be taken into account the same as girder members of a bridge; but there is so much difference in conditions under which these two girders work that there is hard-

ly any comparison. The bridge girder rests on fixed and permanent foundations, always holding the same position and carrying loads in the same way. On the other hand, a rail rests on a series of varying foundations, no two of which are exactly alike at any time, and always subject to differences effected by changes in seasons and climates.

The unstable or yielding track foundation is found very practicable in railroad operation, but the additional strains thrown into the rails in consequence thereof are there nevertheless and should not be overlooked. It is not an uncommon occurrence for a panel of rails in first-class track to carry a load upward of 200 tons over its entire length in half a second of time or less. This enormous weight coming on the rails in such a short interval causes a shock almost equal to a hammer blow. During this short space of time every foot of the rail throughout its entire section is subjected to alternating tension, compression and torsion and the head to crushing and abrasion. There is not a piece of steel made for any structure whatever that has to withstand such severe treatment as that imposed on a rail.

Think for a moment what a rail is supposed to be, and what it is expected to do. It must be hard enough to withstand abrasion, elastic to spring without bending, ductile to stretch without breaking, and rigid enough to carry a load with little deflection. In attempting to work all these qualities in a single composition, and afterward subjecting the material to the extraordinary impacts and strains that a rail receives in track, it is little wonder that some of them fail. It is rather more surprising that the number of failures is not greater. The users contend that rails fail because of defective material or shortcomings on part of the manufacturers in the process of making. The manufacturers claim that the users do not specify the grade of steel, nor weight of rail best suited to their various traffic and climatic conditions; that maintenance of way is not always what it should be; that bar order rolling stock and irregular operations of motive power is responsible for a greater part of rail destruction. It is not possible to determine which party is most at fault, but a better understanding of failures will show that neither is wholly exempt.

Classes of Rail Failures.

There are 9 or 10 classifications of rail failures, but more than 95 per cent. can be placed under less than half that number. The remainder are of rare occurrence and little account. First are the head failures which are the result of piping, or caused by the metal actually shearing off at the sides, usually about on a line with one side of the web. Piping, as already stated, is a defect inherent in the steel, and the whole responsibility for this rests with the manufacturing. Every practicable precaution is constantly exercised against such material going into rails, but in spite of all that can be done some with this defect get into use.

To reconcile the fact that piped rails are found with the claim that sufficient material is discarded from the top of the ingot to insure sound steel, it will be necessary to explain that piping in ingots is not confined entirely to the top, but does at times occur all the way down through the center, although it may not be continuous. Such piping will not show at the ends, nor give any surface indication of its existence when rails are finished. It ordinarily develops under traffic, and then appears by the head flattening or spreading out. Only a very small percentage of piped rails give out suddenly, or without first showing this condition on the head surface and affording time for removal before harm is done. Some railroad engineers pretend to say that they do not regard rails showing slight piping as particularly dangerous, and often allow them to remain in use after their condition is known. It is the opinion of the writer, however, that rails which show piping in any degree are wholly unfit for any main line track and never should be allowed to remain in service.

Split head failures occur mainly on high curvature track and on the inside or low rail of the curves. These are apparently due to irregular bearings of worn wheels and cross strains thrust into the rail head by the thread of false flanges, on the extreme outside corner. This leverage brings the maximum stress at the top of the rail heads, about on a line with the side of the web, where such breaks are generally found.

Another type of failures resulting from rail and track conditions, similar to that just mentioned, is in the metal flowing or crushing off the corners of the head. The inside wheel of a train passing around a curve not only rolls but slips over the rail, and when the track gauge is wide it slides across the head, causing the metal to flow or shell off in long, ragged strips. This kind of giving out is sharply criticised, and often causes considerable anxiety among railroad engineers, on account of the seeming weakness. Such rails have an extremely bad appearance and ordinarily show excessive wear, but they are not unsafe to run over and may be retained in service without any unusual risk until completely worn out.

FAILURES BY COMPLETE FRACTURE.

By far the greatest number of failed rails are due to breakage, that is to say, complete fracture of the entire section. These are not only most numerous, but most dangerous of any in the whole classification. There are three distinctive breaks that may be described and in a measure accounted for as follows:

1. The square break, in which the fracture is almost at right angle with the axes of the rail and is often quite as regular as a saw cut. The fractured surface may be of fine, close, homogeneous texture, but the shape of the break indicates excessive hardening properties in the metal, bringing it close to the point of brittleness, hence easily ruptured by shock and therefore poor quality steel for rails.

2. The angular or shearing break, which generally passes through the section at an angle of 45 degrees or less, with longitudinal axes. This shows that the rail stood a deflection and elongated before breaking, indicating ductility and a perfectly good grade of steel, but probably broken by severe shock or excessive overloading.

3. The base break. There are more failed rails from breaks of this character than from any other cause. It is found in varying degrees on all railroads and in rails from all mills. The principal peculiarity of this break is that it starts at the center of the rail base, directly under the web, and develops longitudinally, extending from 6 to 18 in., and will then run out to the edge of the flange, resulting in a "half moon" or flange break, and in many cases also extending upward through the rail, causing a complete fracture of the entire section. It is safe to say that in more than 90 per cent. of rails reported by the railroads as simply broken, the failures originate as above described, in the base, and more than 99 per cent. of such breaks occur on ties. These are actual conditions as found by investigation. How can they be explained?

The ordinary T-rail now of universal use in this country has long been studied and tested, with the idea dominating that its merits should be considered chiefly, or almost entirely, as a girder reaching across short spans supported at the ends and loaded at the center. When it is found by calculation that the rail is strong enough, with a good factor of safety, to carry the maximum load at the center between these bearings, the notion seems to prevail that all requirements have been determined. It is assured that no particular harm can befall the rail at its bearings, where the support is directly under the base. This seems quite logical, as the load is always applied at the top; the base is properly shaped to sustain tensile strain and rests on foundations placed every few inches along its length. The spans are short, and it can be easily demonstrated that the average size rail has ample strength to carry enormous loads between these supports. As a girder, then, the rail seems to be theoretically and practically correct in shape. But it has always been shown that the roadbed and ties, which constitute the rail foundation, are unstable and yielding, and that the solidity of tie bearings is at times widely variable, making the bearing surface of the whole rail base quite irregular and uneven. These conditions are generally worse when the roadbed is frozen. In consequence, the base member of the rail section has, too, sustained excessive compressive strains at the higher or more solid points of its bearings.

The rail base in compression will, on account of its

shape, buckle, drawing the edges of the flanges upward, thereby causing a cross strain with maximum tension at the center directly under the web, and this is the point where a base break begins. Therefore, it appears that the base member of the T-rail girder as now made is deficient when subjected to compressive strain and for that reason fails.

This covers, in a general outlined description, the disagreeable and much to be avoided things that happen in the use of rails.

The Percentage of Failed Rails is Small.

Failed rails, considered in the abstract, make an uninteresting subject and one that nobody cares much to discuss. From the outside or dissociated viewpoint they bode serious shortcomings on the part of some one. Taken by themselves, whatever the quantity may be, it is always too large, but with the enormous tonnage from which they originate it becomes quite insignificant.

Steel rails of American manufacture on American railroads are to-day, in the aggregate, of excellent quality and giving splendid service. The proportional tonnage in the whole country that seems to be wearing out too fast is not large. The failed rails all told are relatively small in quantity, constituting only a small fraction of 1 per cent. of the tonnage made. The loss in value of material to the steel companies or the railroads on this account is comparatively so little as to be almost negligible.

We get in public reports full and complete accounts of complaints made against rails not giving satisfactory wear and those that fail, but not much mention of the millions of tons in thousands upon thousands of miles of track that are meeting all expectations to the fullest degree, in matters of both service and safety. But the effort for better wearing steel will go on, and pursuit of the ideal rail that will never fail still continues. Just at the present time we seem to have reached one of the transition periods in the manufacture and use of steel rails, in which the rails as made do not quite balance with the railroad traffic as it exists. A correction must be found. The manufacturer is held by certain limitations in character of raw materials that prevent meeting all that might be desirable in changes of composition of steel for the improvements needed. The railroads cannot recede in the matter of heavy loads and fast trains, and must by some means get rails that will hold up to changed conditions as they are.

Some Relief from a New Section.

It is believed that a remedy can be obtained by the cooperation of the manufacturers and railroads in bringing out a revised rail section. This will embody certain cardinal principles, and be designed with a view to overcoming detail deficiencies found in the present sections, at the same time be a better shape to roll. It is suggested that, in comparison with the A. S. C. E. sections, both head and base shall be reinforced, and that the distribution of metal be nearly balanced, making that in the base equal or slightly greater than in the head. It is also proposed that width of base shall be less than hight of rail, which will admit of forming thicker flanges. The advantages of a balanced section, with comparatively thick base are:

1. Lower temperature of the whole section at the final pass, hence a colder finish of the rail head, giving denser and better wearing material.

2. Less cambering and better hot straightening, reducing, as much as possible, the objectionable cold straightening work.

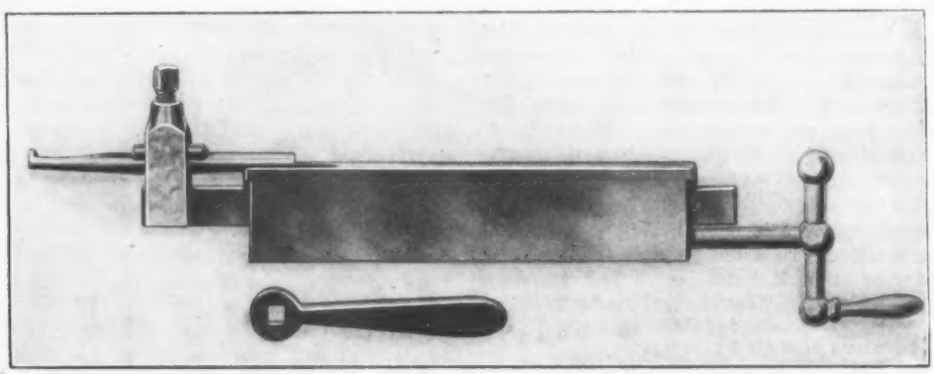
3. A reinforced head to provide against splits and other head failures.

4. A reinforced base to overcome the weakness that seems so prominent in present pattern rails.

It is expected, also, that with this pattern rail the higher carbon steel from grades of ores now available may be made with safety and by longer service prove a benefit to the railroads. The balanced sections can be made easily and economically, and will thereby contribute to the interest of the manufacture. With such rails in track, the qualities of durability and security should gain confidence in their use and redound to the welfare of that very important third party interested in good rails—the traveling public.

The Dosch Compound Lathe Tool.

A lathe tool combining in itself the function of a compound rest is shown in the accompanying illustration as made by the Dosch Mfg. Company, Bridgeport, Conn. It is particularly intended for the use of machinists, toolmakers and patternmakers, and being small and compact it takes up no more room than the ordinary boring tool, therefore may be conveniently carried in the tool box. The device is placed in the toolpost in the same way as the usual tools and bores all kinds of taper holes. It can also be used to turn off lathe centers, screw machine bushings, taper bushings of all sorts, and for boring tapers on all kinds of blanking dies. In connection with the turning of tapers it has the advantage of being easily adjustable to all tapers whether slight or abrupt; whereas, with the taper attachment on the lathe in use, it is possible to turn only a slight taper at the most. The tool can also be used to bore straight holes in the same manner as the common forged tool, and is particularly useful on small holes. A piece of 9-32 in. drill rod will fit in the holder, and this drill rod can be ground to go into any size hole.

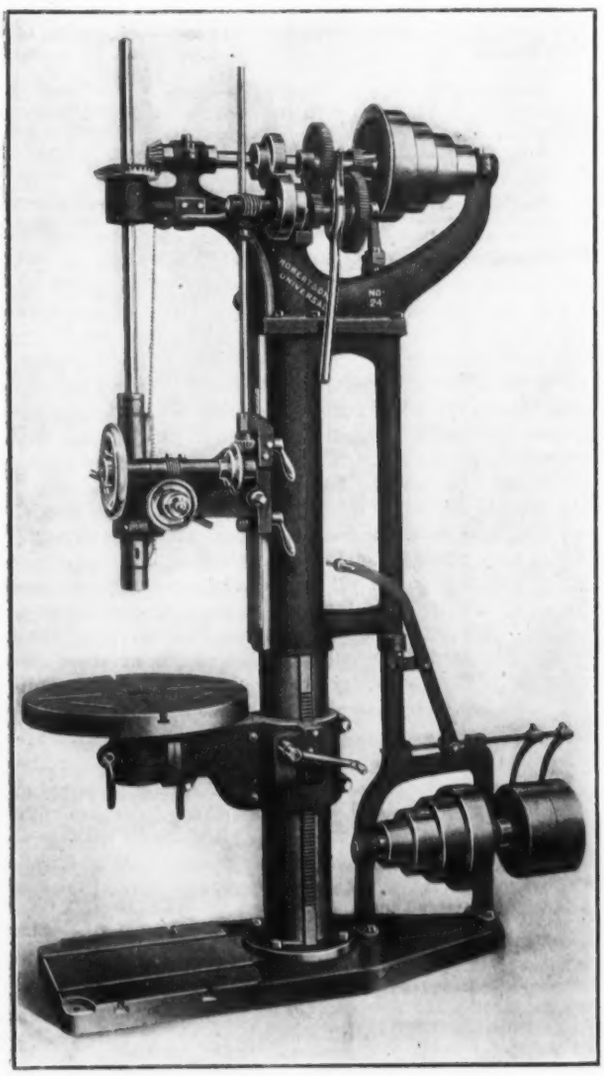


A Compound Lathe Tool Made by the Dosch Mfg. Company, Bridgeport, Conn.

A special application of the tool is in the boring and counterboring of core boxes, or boring on a taper. For such use it is particularly valuable to patternmakers. In bicycle and automobile repair shops it is believed it will be very convenient in handling the various difficult pieces of work presented. At the same time it has its field in large shops, for with it all lathes can be economically equipped to do the work that is usually consigned to a more expensive lathe having a compound attachment. The device is made of steel, highly polished, and the screw, running in a bronze nut, will last indefinitely. The complete adjustment is 2 in. Each tool is furnished with a wrench and a drill or cutting tool. The body is 5¼ in. long, ½ x 1⅛ in. in section, and the overall length with the slide extended, exclusive of the cutting tool, is 11 in. J. J. Halpin, 62 Reade street, New York, is agent for the Dosch compound lathe tool.

The Robertson 24-Inch Universal Drill.

Some of the features of the No. 21 drill press built by the Robertson Mfg. Company, Buffalo, N. Y., and described in *The Iron Age*, July 4, 1907, are to be found in the company's latest design, herewith illustrated. This is a 24-in. universal sliding head drill adapted for heavier work and containing more refinements tending to improve the operating convenience. One similarity of the two drills is the rotatable tilting table which makes it possible to drill a piece of work at any angle. The important changes are the addition of a sliding head for the drill, which gives a greater range of vertical adjustment in the



The New Robertson 24-In. Universal Sliding Head Drill.

head for adjusting for hight of work, so that it is not necessary to resort so much to the raising and lowering of the table; the addition of a stiffening arm at the rear of the column connecting the countershaft and main driving shaft bracket, which very materially stiffens the construction and with the extra heavy column ensures the rigidity that is so essential to accurate work; and the use of a square spindle for driving the drill in place of a splined round shaft as formerly used. This spindle works in a square bore in the driving bevel gear, and since the latter has no feather it has the advantage of a well distributed driving effort.

The sliding head is well ribbed and has a long bearing surface on the column face to resist the bending strain imposed while drilling. The sliding head is clamped by bevel gibs with two handle nuts, so that it is rigidly supported in any of its adjusted positions. When the nuts are loosened the head may be raised and lowered with a crank acting on a squared ended pinion shaft, the pinion on which engages a steel rack set in the face of the column. At the lower end of the head slide is a pawl which engages in the rack and holds it while the handle nuts are being tightened.

The table is revolvable on a perpendicular stem, and is supported by a bracket having a horizontal stem fitting in the knee on the column. At the horizontal, 45-degree and vertical positions of the table a square steel sliding bolt on the top of the knee may be engaged in corresponding slots in the rim of the table bracket, so that these positions may be quickly secured. The knee is split, and by means of a bolt with a handle nut, the stem of the table bracket may be clamped to secure the table in any of its intermediate angular positions. The knee is raised and lowered on the column by a crank which through a worm and worm wheel drives a pinion engaging a steel rack on the side of the column.

The driving pulley has four steps, and through the back gears at the top of the machine eight speeds are obtained. A clutch, the lever of which may be seen in the illustration, engages the driving shaft with the cone pulley direct or with the gear driven by the back gears. The short shaft on which the back gears are loosely mounted is belt driven from the main driving shaft, and transmits the feed through a worm and worm wheel on the vertical feeding spindle. The latter is bevel gear connected at its lower end to the worm shaft, which effects the feed of the spindle quill through worm wheel, pinion and rack on the drill spindle quill. All of the bevel gears, spur gears, worms and worm wheels and racks are machined from the solid.

The base is of box pattern and well ribbed underneath. The surface has T slots both lengthwise and crosswise. The following are the principal dimensions of the machine: Over all hight to top of the cone driving pulley, 7 ft. 4 in.; distance from center of spindle to face of column, 12⅝ in.; diameter of column, 7⅛ in.; diameter of table, 22 in.; diameter of driving pulley, 10 in.; diameter of spindle sleeve, 2¾ in.; diameter of square spindle, 1¼ in., and diameter of the spindle in the sleeve, 1¾ in. The spindle is fitted with a No. 4 Morse taper hole and has a vertical travel of 10½ in. The maximum distance from the base to the lower end of the spindle is 50 in., and from the table to the lower end of the spindle, 36 in. The driving pulley is intended to run at 200 rev. per min. The weight of the machine complete is about 1400 lb.

The machine is furnished in three types—with the sliding head, the universal table, the wheel feed by hand, and the quick return, or the same with the addition of the power feed, or the same with the addition of power feed and back gears. The illustration gives every indication of the truth of the builders' statement that the machine is well proportioned to secure accuracy of alignment and stiffness under powerful drive.

The Kewanee Tube Company, Kewanee, Ill., is arranging to provide a free lecture course running through the winter months for its employees and as many members of their families as can be accommodated in the large armory building, which will be used for this purpose. The lectures will be supplied by able and well-known speakers and will embrace topics designed to be entertaining and at the same time helpful in an educational way. In providing this course of lectures the company is actuated by a desire to promote higher standards of thought and action in their employees, to the end that they may discharge their duties as citizens and workmen in a more intelligent and efficient manner.

The National Foundry Company, Erie, Pa., is now pouring from 200 to 270 molds per heat in its steel foundry. It recently broke the record by pouring 275 molds from an 18 ton heat. Although some of them weigh but 2 lb. apiece, the castings would average about 60 lb. each, there being 580 pieces in the heat. This demonstrates that with proper furnace conditions and shop practice it is possible to make a large number of small pieces per heat. It took 1 hr. 35 min. to pour this heat. It is the usual practice for steel foundries to pour from 100 to 200 molds per heat.

Iron Ore Production in 1906.

Annual Report of United States Geological Survey.

WASHINGTON, D. C., November 12, 1907.—The forthcoming annual report of the United States Geological Survey on the production of iron ores in 1906, prepared by Edwin C. Eckel of the Survey's staff, is in certain important respects a more comprehensive monograph than any preceding official report devoted to this subject. In addition to the usual statistics, Mr. Eckel has taken up the interesting question of the iron ore reserves of the United States, and presents figures showing conclusively the erroneous character of certain pessimistic statements current during the past year foreshadowing the early exhaustion of the American deposits. Through the courtesy of the Director of the Survey, the correspondent of *The Iron Age* is enabled to present the following abstract of Mr. Eckel's interesting report:

The year 1906 witnessed a steady growth in production in all branches of the iron industry, from ore to finished products, previous records being broken in the production of ore, pig iron and steel. The chief factors in keeping prices down to a reasonable level have been, curiously enough, the great iron and steel producing corporations. Their attitude in this matter is not, of course, dictated by altruistic motives, but it affords a refreshing contrast to the method of procedure which a few years ago would have been considered to be the immediate consequence of the consolidation of interests in any industry. Toward the close of 1906, however, prices in several lines rose more sharply than was generally considered advisable, and it is doubtful as to how far control will be possible in the future in case generally prosperous conditions support a heavy demand for iron and steel products. It is known, moreover, that heavy increases in production will be possible during the latter part of the current year and in 1908, and the probabilities are, therefore, in favor of lower rather than of higher prices in the near future.

Statistics of Production.

The iron ore production of the United States in 1906 amounted to 47,749,728 gross tons (2240 lb.), valued at $100,597,106. As compared with 1905, the most productive previous year, this was an increase of 12.28 per cent. in tonnage and of 33.83 per cent. in value. The production for 1905 and 1906, by States, is given in the following table:

Total Production by States in 1905 and 1906.

State.	1905. Gross tons.	1905. Value. $	1906. Gross tons.	1906. Value. $
Alabama	3,782,831	4,257,155	3,995,098	5,123,539
Arkansas and Tex.	27,668	39,510	*36,660	36,660
Colorado	†133,471	398,700	14,078	22,525
Connecticut and Massachusetts	25,931	77,278	31,343	94,129
Georgia	200,842	296,561	411,230	734,780
Kentucky, Maryland and W. Virginia.	44,969	53,766	46,940	58,175
Michigan	10,885,902	23,367,233	11,822,874	31,145,087
Minnesota	21,735,182	35,895,001	25,364,077	51,799,256
Missouri	‡113,112	162,028	80,910	158,109
Montana, Nevada, New Mexico, Utah and Wyoming.	690,631	1,030,585	792,190	946,551
New Jersey	526,271	1,269,374	542,518	1,570,578
New York	1,139,937	3,197,919	1,041,992	2,635,639
North Carolina	56,282	75,540	56,057	75,638
Ohio	19,989	26,624	17,384	29,706
Pennsylvania	808,717	1,060,162	949,429	1,246,267
Tennessee	734,770	918,850	870,734	1,307,433
Virginia	740,345	1,256,428	828,081	1,579,817
Wisconsin	859,283	1,718,890	848,133	2,033,217
Totals	42,526,133	75,165,604	47,749,728	100,597,106

* Production of Texas alone.
† Includes the manganiferous and silver manganiferous iron ores.
‡ Includes a small production from Iowa.

The following table shows the production of iron ore in the United States in 1906, by States and varieties, in gross tons:

Production in 1906 by States and Varieties.—Gross Tons.

State.	Brown hematite.	Red hematite.	Magnetite.	Carbonate.	Total quantity.
Alabama	821,301	3,173,797	.....	....	3,995,098
Colorado	14,078	.....	.....	....	14,078
Connecticut and Massachusetts	31,343	.....	.....	....	31,343
Georgia	305,624	105,606	.....	....	411,230
Kentucky, Maryland and West Virginia	18,895	27,433	.....	612	46,940
Michigan	.....	11,822,874	.....	....	11,822,874
Minnesota	.....	25,364,077	.....	....	25,364,077
Missouri	41,805	39,105	.....	....	80,910
Montana, Nevada, New Mexico, Utah, and Wyoming	.....	620,635	171,555	....	792,190
New Jersey	20,611	.....	521,907	....	542,518
New York	1,000	128,385	912,607	....	1,041,992
No. Carolina	.....	.....	56,057	....	56,057
Ohio	.....	.....	.....	17,384	17,384
Pennsylvania	134,027	8,854	806,548	....	949,429
Tennessee	590,763	279,971	.....	....	870,734
Texas	36,660	.....	.....	....	36,860
Virginia	735,204	92,257	620	....	828,081
Wisconsin	29,752	818,381	.....	....	848,133
Totals	2,781,063	42,481,375	2,469,294	17,996	47,749,728

Value of Ores.

The survey has been at some pains to secure data on the value per ton of the different varieties of iron ore in the various producing States. The figures given are intended to represent value at the mouth of the mine and are taken directly from the replies of the producers. It is probably unnecessary to caution the reader that such data may be accepted as merely a fair approximation to the truth. The element of inaccuracy arises from conditions in the iron ore business and cannot be readily overcome. By far the bulk of the iron ore produced in the United States is mined directly by pig iron producers for use in their own furnaces, and the valuation which they place on such ore is therefore entirely a matter of accounting. If all of the American iron ore were to be bought by iron furnaces in open market from an entirely distinct set of iron miners, the average prices would probably be considerably in excess of those now reported. The following figures show the average value per gross ton of iron ore in 1906, by States and varieties:

Average Value of Iron Ore Mined in 1906.

State.	Brown hematite.	Red hematite.	Magnetite.	Carbonate.
Alabama	$1.62	$1.19	....	....
Colorado	1.60	....	....	....
Connecticut and Massachusetts	3.00	....	....	....
Georgia	1.86	1.57	....	....
Kentucky, Maryland and West Virginia	1.52	1.01	....	$3.00
Michigan	...	2.63	....	....
Minnesota	...	2.04	....	....
Missouri	2.01	1.90	....	....
Montana, Nevada, New Mexico, Utah and Wyoming	...	1.14	$1.39	....
New Jersey	2.46	....	2.91	....
New York	4.00	2.40	2.55	....
North Carolina	...	....	1.35	....
Ohio	...	....	....	1.71
Pennsylvania	2.33	2.42	1.14	....
Tennessee	1.62	1.26	....	....
Texas	1.00	....	....	....
Virginia	1.90	1.94	3.08	....
Wisconsin	2.17	2.41	....	....
Totals	$1.78	$2.13	$2.05	$1.75

Consumption in 1905 and 1906.

The apparent consumption of iron ore in 1906 was 49,355,343 tons, as compared with 43,433,138 tons in 1905. These figures are based upon the following data:

1906.—Domestic iron ore produced, 47,749,728 tons; stocks of ore at mines, 3,281,789; imports, 1,060,390; exports, 265,240; stocks of ore at lower lake ports, December 1, 6,252,455; zinc residuum, 93,461; apparent consumption, 49,355,343 tons.

1905.—Domestic iron ore produced, 42,526,133 tons; stocks of ore at mines, 3,812,281; imports, 845,651; exports, 208,017; stocks of ore at lower lake ports, December 1, 3,452,621; zinc residuum, 90,289; apparent consumption, 43,433,138 tons.

Reserves of Ore.

About two years ago, in response to a request from the Swedish Parliament, an eminent Swedish geologist

prepared a report on the iron ore reserves of the world. The character of the report in the form in which it reached the American public is fairly indicated by the following extracts:

It will surprise a great many to learn that we are likely to run short in iron inside of a single century if we keep up the present rate of consumption. As a matter of fact, we are more likely to increase the consumption than we are to reduce it. The world has only 10,000,000,000 tons of iron ore available. . . . The present output of ore and the amount of ore actually consumed by each are as follows, in tons:

Swedish Estimate of Ore Deposits.

Country.	Workable deposits.	Annual output.	Annual consumption.
United States	1,100,000,000	35,000,000	35,000,000
Great Britain	1,000,000,000	14,000,000	20,000,000
Germany	2,200,000,000	21,000,000	24,000 000
Spain	500,000,000	8,000,000	1,000,000
Russia and Finland	1,500,000,000	4,000,000	6,000,000
France	1,500,000,000	6,000,000	8,000,000
Sweden	1,000,000,000	4,000,000	1,000,000
Austria-Hungary	1,200,000,000	3,000,000	4,000,000
Other countries		5,000,000	1,000,000
Totals	10,000,000,000	100,000,000	100,000,000

While it is probable that the foregoing statement does not take into adequate account the undeveloped ore deposits of Utah and Alabama, its teachings are nevertheless obvious and impressive. Of the world's workable iron ore deposits, as at present known, the United States possesses only about one-ninth, and at the present rate of consumption the entire supply will be exhausted within the present century.

It must be admitted that an official statement such as this might fairly cause alarm to those unacquainted with the facts of the case. As a matter of fact, however, the figures given cannot be accepted as reliable, and it seems desirable to present a more careful statement of the case. As will be shown below, the Swedish report on iron ore reserves probably contains an error of something over 1000 per cent. in its estimate of American ore tonnage.

Deposits of the Lake Superior Region.

The Lake Superior District, at present the leading American producer, has been explored more thoroughly than any other ore field in the United States, but estimates as to total tonnage range within rather wide limits. At present the totals commonly quoted vary from 1,500,000,000 to 2,000,000,000 tons, of which the United States Steel Corporation is commonly supposed to control over three-fourths. This supply is being drawn on to meet a constantly increasing annual demand, and it is conceded that before 1915 the district will probably be called upon to ship over 50,000,000 tons of ore a year. It is obvious that at such a rate the Lake Superior ores can hardly be expected to last beyond the year 1950, and it is equally obvious that long before that date the value of good workable deposits of iron ore, both there and elsewhere in the United States, will have increased immensely. During the past year ore lands in the lake district have been sold at a valuation of $1 per ton of ore in the ground, though the average valuation is still of course considerably below that price.

In the Rocky Mountain and Pacific States a few large iron ore deposits are known to exist, and many others are reported, but any attempt at an estimate of total tonnage would be, with only our present knowledge of the subject, merely the wildest sort of guessing.

A more promising field lies in the older Eastern States. It is probable that careful exploratory work will develop magnetic iron ores in New York, New Jersey and Pennsylvania in quantities far in excess of anything usually considered possible in those States. Here also close estimates are impossible.

Southern Ore Deposits.

With regard to the Southern iron ores the case is very different. Here the work which the Geological Survey has carried on during the last three years, and which was planned so as to obtain data on the quantity of ore available, gives a fairly secure basis for tonnage estimates. It is safe, therefore, to submit the following figures as representing the minimum values for the workable iron ore reserves above the 1000-ft. level of certain Southern States, with the caution that further exploratory work in the South will probably greatly increase rather than decrease these estimates:

Extent of Deposits in Four Southern States.

	Red ore. Gross tons.	Brown ore. Gross tons.
Alabama	1,000,000,000	75,000,000
Georgia	200,000,000	125,000,000
Tennessee	600,000,000	225,000,000
Virginia	50,000,000	300,000,000
Totals	1,850,000,000	725,000,000

This gives a total estimated reserve, for the red and brown ores of the four States noted, of over 2,500,000,000 tons. If to this we add the ores occurring at deeper levels in the States named, and also the red and brown ores of Maryland, West Virginia and Kentucky, and the magnetic ores of the other Southern States, it is probably fair to assume that the total Southern ore reserve will amount to very nearly 10,000,000,000 tons, or five times that credited to the Lake Superior District. Much of this ore is, of course, unworkable at the present day, but all of it should be counted on in any estimate of total ore reserves.

In considering these figures it will be well to bear in mind that the Southern red ores will average from 33 to 43 per cent. metallic iron, but that they carry so much lime as to be almost or quite self-fluxing. The brown ores, as washed, will range from 40 to 50 per cent. metallic iron. It may be further added that the estimates as to red ore tonnage are probably much more accurate than those relative to brown ores.

To sum up the matter—in place of the 1,100,000,000 tons credited by the Swedish geologist, it is probably safe to say that the United States has from 10 to 20 times that reserve of iron ore.

The present rate at which our ore is being mined is as follows: 1903, 35,019,308 tons; 1904, 27,644,330 tons; 1905, 42,526,133 tons; 1906, 47,749,728 tons.

Assuming that the demand during the present century may range from 50,000,000 to 100,000,000 tons per year, the Lake Superior district would last for 25 to 50 years more, if it supplied the entire United States. But counting on the known reserves elsewhere in the country, the ore will last for a much longer period, though, of course, it must necessarily show a gradual but steady increase in value and in cost of mining, along with an equally steady decrease in grade. No attempt is here made to consider a very important factor in the problem—the extent to which Cuban, Haytian and other high grade foreign ores may be imported in the near future.

Iron Districts of United States.

Iron ore is mined for blast furnace use in only 26 States of the Union, though it occurs in almost every State and Territory. For convenience in description, it is advisable to group the producing States in four natural districts defined by geographic and trade considerations:

1. Lake Superior.--Michigan, Minnesota and Wisconsin.
2. Southern.—Alabama, Georgia, North Carolina, Tennessee, the Virginias, Maryland, Kentucky, Arkansas, Missouri and Texas.
3. Northern.—New England, New York, New Jersey, Pennsylvania, Ohio and Iowa.
4. Western.—Colorado, Utah, Wyoming, Arizona and New Mexico.

The present relative importance of these four districts as iron ore producers is well brought out by the following table, which gives the output of each district in gross tons for 1905 and 1906, and the percentage of the total American output produced by each district in those years.

Production of Iron Ore by Districts.

	1905. Tons.	1905. Per cent.	1906. Tons.	1906. Per cent.
Lake Superior	33,480,367	78.73	33,035,084	79.66
Southern	5,700,819	13.41	6,325,710	13.24
Northern	2,520,845	5.93	2,582,666	5.41
Western	824,102	1.93	806,268	1.69
Totals	42,526,133	100.00	47,749,728	100.00

It would perhaps be hazardous to say that all of the large high grade deposits of iron ore in the Lake Superior District are now definitely known and located. The fact remains, however, that explorations on the new ranges—Baraboo, Cuyuna and the Canadian group—during the past few years have been with few exceptions distinctly disappointing. In the Coleraine region, on the western

end of the Mesaba, large quantities of ore have been developed by drilling, but the bulk of these ores is low grade and very sandy. Careful washing improves them remarkably, however, and they can be counted on to form part of the supply of the near future.

The principal development of the year in the Lake Superior iron region, the leasing of the Great Northern or Hill ore lands to the United States Steel Corporation, was, in its initial stage, financial rather than industrial. It would be difficult to overestimate the importance of this step in its relation to the future of the Lake Superior iron ore industry, and, in fact, to the American iron trade in general. Its most immediate effects were to appreciably strengthen the steel corporation's ore reserves, to remove the possibility of any serious future competition based on Lake Superior ores, and to increase the royalty scale for undeveloped Lake Superior ores. The steel corporation is now currently credited with controlling something between two-thirds and three-fourths of the entire Lake Superior iron ore supply. As the Geological Survey reports on the Lake districts contain nothing on which to base tonnage estimates, there is no ready means of checking up this current belief. Whatever the exact percentage may be, it is certain that the recent acquisition removed from the market the largest holding of ore lands known to remain in the district. It is believed that the bulk of this ore will fall considerably below the requirement of 59 per cent. metallic iron taken as the base for royalties. Widely variant estimates have been published as to the ore tonnage covered by this lease. T. F. Cole, in testifying before a Minnesota Legislature committee, is reported to have said that on the Hill lands approximately 175,000,000 tons of ore had been disclosed by exploratory work. On the assumption that as much more remain entirely untested, the lease would cover something like 350,000,000 tons of ore. W. L. C.

The American Steel Foundries to Pay a Dividend.

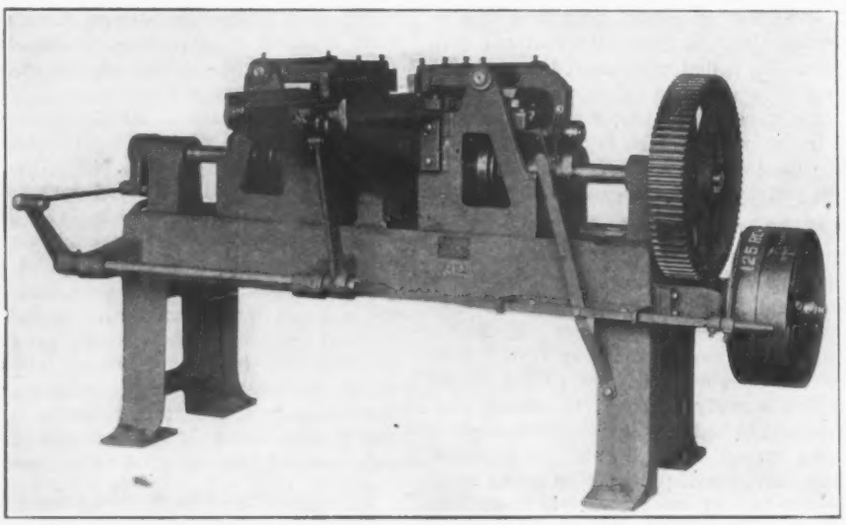
At a meeting of the directors of the American Steel Foundries November 7, an adjustment of the dispute between the management and the dissenting minority was arranged. The following statement has been given out in explanation of the settlement terms:

> The directors of the American Steel Foundries have decided to recommend to the stockholders' meeting, to be held at an early date, that for the accumulated dividends on the preferred stock, amounting to $20 per share, there be given to holders of the preferred stock 4 per cent. debentures, payable within 15 years, and also that at the end of the first six months of the present fiscal year there be declared a dividend of 3 per cent., payable in cash; both of the proposed distributions to be made, however, on condition that the holders of preferred stock shall exchange their present holdings for a like amount of new stock, with the cumulative provision excluded. The plan, if accepted, will probably be of benefit to and should be unanimously accepted by holders of both preferred and common stock.

There is not the slightest doubt, it is said, that the stockholders will ratify the plan. The 4 per cent. a year interest on the debentures which constitute the company's proposed scrip dividends will be paid semiannually. The American Steel Foundries reported net earnings of $3,100,000 at the close of its last fiscal year. It has a working capital of $4,834,000, not including securities owned. This working capital exceeds the recent market value of the preferred stock at $30 a share by more than $1,000,000. The announcement that the management was preparing to liquidate all arrears in dividends on the preferred stock was received favorably, regardless of the fact that the new preferred issue will not have the cumulative feature of the old security. Privileges or right to participate in the contemplated dividend distribution and exchange of preferred stock were issued and sold on the New York Curb at 17½ to 18.

The Toledo Edge Forming Machine.

Several sizes of automatic machines for forming and folding the edges of large sheets used for making stove pipe and elbows, and also for forming and folding the two edges of zinc facings used in the manufacturing of washboards, have recently been designed by the Toledo Machine & Tool Company, Toledo, Ohio. This work has heretofore been performed by the use of bar folders and forming dies, necessarily a much slower and less accurate process. The acompanying illustration shows what is known as the Toledo No. 312 automatic edge folding and forming machine. It has capacity for folding and forming the two edges of sheets from 14 to 30 in. in length at a rate of 20,000 to 25,000 pieces per day of 10 hr.



Automatic Edge Forming and Folding Machine, Built by the Toledo Machine & Tool Company, Toledo, Ohio.

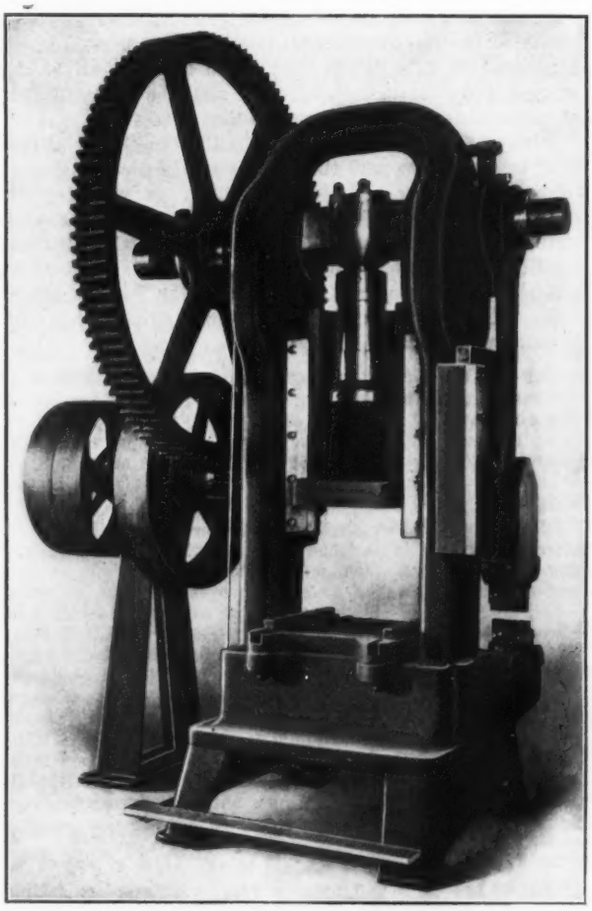
The operator places the sheet in holders constructed for accurately locating the sheet convenient for the automatic carrier to take up the sheet and carry it forward. The carrier places it in position for the automatic formers, where it is automatically clamped in position and the edges formed and folded to the proper size and shape by means of cam actuated movements. These automatically release the work as soon as completed, when the automatic carrier again picks up the work and ejects it from the machine, at the same movement bringing the following sheet in position. The machine is made adjustable for sheets ranging in width from 10 to 30 in. and for folding sheets as long as 30 in., and it is built to work metal as heavy as No. 22 gauge.

The cams are faced with hardened tool steel and the gearing is machine cut from the solid. The forming edges are all made of tool steel and hardened, and independently inserted in such a manner that repairs or renewals can be easily and quickly made or forming edges for different sizes or shapes inserted as desired. The machine certainly is a labor saver of considerable note for work of the character described. It is designed so that the ordinary class of help will suffice for operating it.

A Heavy Consolidated Forging Press.

On account of the great variety of shapes and forms in which stampings and forgings are required, makers of power presses often find it necessary to adapt their standard forms to meet special requirements. The tool herewith illustrated represents one of five straight-sided presses built by the Consolidated Press & Tool Company, Hastings, Mich., for special service in a drop forge plant. Being designed for heavy service, it is back geared and is belt driven through a shaft with an out-board bearing. The main slide is actuated by a crank and the shear for trimming forgings attached to the right side by an eccentric.

The character of the work for which the press was specially arranged required unusual space between the uprights—28 in. This leaves a clear space of 18 in. between the guides. The plunger has a stroke of 5 in. and



A Heavy Forging Press Built by the Consolidated Press & Tool Company, Hastings, Mich.

the die space from the top of the bolster to the lower face of the slide when down is 16 in. On this particular machine the clutch mechanism is placed on the left side to suit the conditions of work in the shop for which it was intended. A much longer and heavier slide is also provided for the side shear than is usual in this style of press. This shear gives a 3-in. stroke, and is fitted with detachable blades for which special die blocks and punches may be substituted.

To guard against breakage in case the operator should insert a piece of work not properly heated, a releasing clutch is fitted in the hub of the large driving gear, which allows the gear to slip on its shaft if an excessive resistance is offered to the slide. The end bearings are self-oiling and the flywheel, instead of being oiled through the hub, receives lubrication through an oil hole in the end collar. This press is built in six sizes ranging in weight from 3000 to 20,000 lb.

The Southern Pacific Railroad Company is building for the use of its employees a chain of clubhouses along its lines in Nevada, California, Arizona, New Mexico and Texas. They will be not only attractive in appearance, but will be equipped with every convenience for the comfort and entertainment of the men who are to use them. The fees charged are nominal, barely covering wear and tear.

The Railroads and Alabama's Iron Interests.

The Louisville & Nashville Railroad is the shining mark for restrictive legislation in Alabama. This has moved H. F. Debardeleben, the veteran Southern iron manufacturer, to come to the defense of the railroad in a vigorous letter to the Birmingham *Age-Herald*, from which following interesting extracts are taken:

"In 1872 there assembled in Birmingham a small party of men who came to this district with a view of bettering their condition. At that day we were a united people; each and every individual did his best to aid in the upbuilding of the city that we all now have the privilege of enjoying. We were all drummers to get as many railroads and industrial institutions centered here as possible. We lobbied and made exhibits of how much freight there was to be created for them to haul away. In those days to get an additional railroad was of great importance, and to charge for a right of way subjected the landowner to adverse criticism. No one thought of doing anything that tended to cripple the railroads that we expected to use. One of these roads has many times aided in creating an output of coal, ore and iron, by building branch roads and giving the lowest freight rates in the United States for assembling the raw material required to produce a ton of iron, thereby making it possible for the various plants to succeed in drawing money from other States to be invested and distributed here.

"During the early days some of us would start to build a plant without enough money in sight to complete it. We seldom had any working capital. The enterprise was hard to get started, but we were so nervy and persistent that we would undertake to construct a plant and then take the chances that older districts would never have taken. We certainly got into trouble over some of our ventures. When financial trouble struck us we frequently went to the protector of the district. We unbosomed ourselves to him like a good Catholic would to his priest; told him our financial trubles. He would in turn go to his directors, and would allow us to ship pig iron without paying the freight for months. At other times, when a furnace plant found that it needed more money, he would furnish from $50,000 to $100,000 until it could be paid back. At other times he would take a part of an issue of bonds. He was always ready to do anything that was reasonable to aid in creating tonnage, which meant money to the district and freight for his road.

"It now seems hard that this district should sit tamely by and see this grand railroad hammered and crippled by our lawmakers in Montgomery without raising our voices in protest. Without railroads we would dry up like a wet weather spring, and if they are crippled and their credit impaired by adverse legislation, we will be hurt just in proportion that the railroads are. All property, whether belonging to corporations or individuals, will go down in the same ratio with that of the railroad companies. The view I take of the railroads is that they are a part of our property, and should be kept in the highest state of preservation and efficiency, that we may use them for many times the amount of tonnage now being transported by them.

"The Legislature, at its last session, has injured us millions of dollars. The work of the payroll builders is at an end until confidence is restored and reaction sets in. As an individual I feel that my life's work opening new properties is ended, for by the time the financial distrust rolls by I will be too old for the hardships of a pioneer. When the Legislature meets in response to the Governor's call for an extra session, it is to be hoped that each member will think for himself, and do nothing that will further cripple us."

The city of Bath, Maine, has been given $70,000 by the will of a lady for the establishment of an industrial school for boys and girls.

British Patent Law Amendments.

Manufacturing of Patented Goods in Great Britain Compulsory.

The drastic and far-reaching amendments that were made to the British patent code in the last session of Parliament are to come into force on January 1, 1908. These changes in the code constituted by the acts of 1883, 1888 and 1902 are in the main directed to two ends. They are intended, first, to compel owners of patents to manufacture in Great Britain, and, second, to protect manufacturers in Great Britain from being obliged to submit to onerous conditions for the use of patented machinery or equipment.

A Government Measure.

The bill making these amendments was a Government measure. It originated with the Board of Trade, and was piloted through the House of Commons by Lloyd George, who is president of the board, and a member of the Campbell-Bannerman Cabinet. At first reading stage of the bill Mr. George explained in some detail why the Government was asking Parliament to prevent owners of patents from insisting on onerous conditions. He indicated to the House that it was the conditions imposed by an American shoe machinery company that had impelled the Government to take action for the protection of the users of patented machinery. He said:

In these foreign patents there is another way of restraining British industry. There may be a very ingenious invention, particularly in the boot trade. That is where this grievance has been suffered most keenly. A very ingenious foreign patent may be invented, but before you are allowed to use it in your trade you have got to sign a document, a kind of lease, possibly for 20 years. During the whole of that 20 years you are not to be allowed to use any other machinery at all in your works. You may have a considerable improvement invented by a Britisher or by some foreigner, but still under the conditions of your lease you are not allowed to put any other machinery into your works, although it may be infinitely better. That is a course to the detriment of trade.

A decision of Justice Wills on this point is at the present moment a serious one. It was supposed that these were contracts in restraint of trade, but it was decided that they were not. Justice Wills said: "He has a right to prevent people using this patent or dealing with it at all; he has a right to impose his own conditions; it does not matter how unreasonable the conditions are." The result has been that the attempt to upset these contracts has utterly failed, and there are a good many people in this country who are working under these impossible conditions, which at any time may become exceedingly serious for the boot industry in this country. In future I propose that these conditions shall be absolutely nugatory.

To make such conditions nugatory and to cheapen procedure under the patent code is the aim of section 16 in the new act (7 Edward VII, C. 28). It provides that petitions for the grant of a compulsory license for the use of a patent or for the revocation of a patent under section 3 of the patents act of 1902 shall, in future, be referred by the Board of Trade to the law courts instead of, as formerly, to the Judicial Committee of the Privy Council. This amendment reduces the law costs attendant on patent litigation, and, moreover, and more important still, section 16 of the act of 1907 provides that for the purposes of section 3 of the act of 1902 the reasonable requirements of the public in regard to a patent shall not be deemed to have been satisfied

(*a*) If by reason of the default of the patentee to manufacture to an adequate extent and supply on reasonable terms the patented article or any parts thereof, which are necessary for its efficient working or to carry on the patented process to an adequate extent or to grant licenses on reasonable terms, any existing trade or industry, or the establishment of any new trade or industry, in the United Kingdom is unfairly prejudiced, or the demand for the patented article or the article produced by the patented process is not reasonably met; or

(*b*) If any trade or industry in the United Kingdom is unfairly prejudiced by the conditions attached by the patentee before or after the passing of this act to the purchase, hire, or use of the patented article, or to the using or working the patented process.

At second reading stage of the bill, the stage when the House of Commons approved of its principles and sent it to committee for discussion of details, there were vigorous complaints that the clause as then drafted was not retroactive. Mr. George then defended the clause as it stood, but at a later stage of the bill the clause was amended; and, after January 1, 1908, all contracts, whether made before or after the passing of the act, will be subject to the conditions of section 16.

How British Industries Have Been Hampered.

Emphasis and frankness are characteristic of the president of the Board of Trade. "I am not afraid of foreign competition," he remarked when the bill was read a first time, "as long as British trade is free to fight it—free from impossible conditions, and free from equally stupid tariff systems at home. But at the present moment many British industries are bound hand and foot by the working of our patent system. Many a British industry has been completely wiped out by privileges conceded by our own institutions to foreigners, and all I propose in this bill is that these bonds shall be destroyed and that British industry shall be perfectly free to engage in the severe struggle that besets it."

Out of 14,700 patents issued in 1906 in Great Britain 6500 were foreign, and there were then no conditions as to manufacturing patented machinery or patented articles in Great Britain. In the new act there are some stringent conditions as to manufacturing, although these conditions are not quite so stringent in all respects as those to the same end in the Canadian patent act of 1903. Section 16 imposes these new British conditions, as follows:

At any time, not less that four years after the date of the patent, and not less than one year after the passing of this act [August 28, 1907] any person may apply to the Comptroller of Patents for the revocation of a patent on the ground that the patented article or process is manufactured or carried on exclusively or mainly outside the United Kingdom.

2. The comptroller shall consider the application and if, after inquiry, he is satisfied that the allegations contained therein are correct, then, subject to the provisions of this section, and unless the patentee proves that the patented article or process is manufactured or carried on to an adequate extent in the United Kingdom, or gives satisfactory reasons why the article or process is not manufactured or carried on, the comptroller may make an order revoking the patent, either (*a*) forthwith or (*b*) after such reasonable interval as may be specified in the order, unless in the meantime it is shown to his satisfaction that the patented article or process is manufactured or carried on within the United Kingdom to an adequate extent, provided that no such order can be made which is at variance with any treaty, convention, arrangement or engagement with any foreign country or British possession.

3. If within the time limited in the order the patented article or process is not manufactured or carried on within the United Kingdom to an adequate extent, but the patentee gives satisfactory reasons why it is not so manufactured or carried on, the comptroller may extend the period mentioned in the previous order for such period not exceeding 12 months, as may be specified in the subsequent order.

4. Any decision of the comptroller under this section shall be subject to appeal to the court, and on any such appeal the law officer of the crown, or such other counsel as he may appoint, shall be entitled to appear and be heard.

The Manchester Chamber of Commerce, more than any other commercial organization in England, agitated for these changes in the patent code, which have now been made by the new act. The new law and the way in which it is to be worked were the principal subjects of Mr. George's speech when he was the guest of the Manchester chamber at a banquet on October 17. He said:

We have got to see that this act of Parliament is put into operation. There is a good deal in it for the trade and industry of this country. I will tell you one thing I have done. I have got out, in so far as the resources of my department will allow, a list of the patents taken out in this country and worked abroad. If you simply looked at it you would be amazed. It is a thick volume of hundreds of patents, some of them no doubt insignificant, some of them no doubt not very valuable, but some of them are of enormous value, covering practically every branch of industry. What does that mean? It means that every one of those patents registered here and worked abroad has excluded a valuable, profitable British industry which would afford em-

ployment for a good many people in this country. To call that free trade is to libel a good cause.

It is really worth while making an effort that the act shall be a reality and not a sham. It is a reality so far as its powers are concerned. Whether it will be a reality in its operation depends on the amount of co-operation between the chambers of commerce and the Board of Trade. At the last moment it occurred to me that it would be useful to secure the intervention of the law officers of the crown, but you cannot have that in the first stage, because the first stage is before the comptroller of the Board of Trade, and, therefore, it would be rather an invidious thing for a law officer of the crown to appear before the comptroller of the Board of Trade, when at the present moment the law officers constitute a court of appeal from the comptroller. It would be clearly impossible, so you must secure somebody who would bring the case into court, as it were.

Probably the most expensive part of the proceeding will be the appeal from the comptroller afterward to the court. There we can help you. In the first instance, we must get somebody who will bring it to cognizance of the Board of Trade. We are getting out a list, and we mean to call the attention of these gentlemen to the provisions of the act, and to call upon them, as far as we can, to explain what adequate reason they have why they are not working patents granted in this country for the benefit of this country. I would appeal to the chambers of commerce, and I would invite them to put themselves into contact again with the Board of Trade, and to find out some method whereby the initial step shall be taken to call upon these hundreds of foreign patentees to assign good cause for using this monopoly granted by the crown for the purpose of excluding Britishers from setting up industries in this country.

How Such Legislation Has Worked in Canada.

The amendments to the Dominion patent code, made in 1903, have already led to the establishment of numerous American manufacturing plants in Canada. At some of these plants patented machinery is wholly manufactured, at others the law of 1903 is complied with by the assembling of parts made at plants in the United States. The new British law, as the president of the Board of Trade has always insisted, is not intended as a protectionist measure, in the common acceptance of the word protection, and it is possible that assembling may be accepted by the British Government as a compliance with subsection 2 of section 15.

One of the clauses in the Canadian act of 1903 makes a patent null and void at the end of two years, "unless the patentee shall commence and continuously carry out in Canada the construction or manufacture of the invention patented in such a maner that any person desiring to use it may obtain it at a reasonable price at some manufactory in Canada." Another clause decrees that "if after 12 months from the granting or authorized extension of a patent the patentee imports into Canada the invention for which the patent is granted, such a patent shall be void as to the interest of the person so importing."

The Foreign Tariff Commission.

James B. Reynolds, Assistant Secretary of the Treasury, and chairman of the Government commission sent to Europe in September to investigate various features of the tariff relations of the United States and foreign countries, returned on the steamship Amerika Saturday. The other members of the commission, Marion De Vries and Byron S. Waite of the Board of United States General Appraisers, are still abroad. Mr. Reynolds will file a formal report with the Secretary of the Treasury, covering the chief points in the investigation. It has been generally understood in customs circles that an important part of the work of the commission relates to the gathering of data concerning trade, export and tariff matters prevailing in Germany, with a view of utilizing such information by the Administration in the preparation of the permanent reciprocal convention to be submitted to Congress the coming winter. The chairman of the commission declined to go into details beyond a short statement which he gave out, as follows:

"The commission went abroad to acquire certain information to aid in the proper and fair administration of the customs law. We went to look, listen and learn; not to revise the tariff or reform the world. It was the most practical of errands. It was to look into the customs conditions and the customs relations with the United States of four countries—namely, France, Austria, Germany and England. We were met in the fairest and friendliest spirit. Every door that led to desired information was thrown open to us and every Government facility placed at our disposal. We return with the information we sought—not gathered in academic form and fashion, but obtained at first hand by personal contact with the foreign Government officials and with representative business men and commercial bodies.

"Outside of the broad and general customs questions we looked into some special matters, the most important of which was, perhaps, the much discussed question of Limoges china and its market value in France. We are very hopeful that the arrangements and plans made as the result of this investigation will be effective in bringing about a settlement of this matter, which has been a disturbing factor for so long a time, and that by the first of the year it will be taken entirely out of the field of controversy. The exact results of our trip, with its details and recommendations, will be submitted in a formal report to Secretary Cortelyou."

The Philadelphia Foundrymen's Association.

The regular monthly meeting of the Philadelphia Foundrymen's Association was held at the Manufacturers' Club on the evening of November 6, with the president, Thomas Devlin, in the chair. After transacting routine business the General Pneumatic Tool Company, Stephen Girard Building, Philadelphia, Pa., represented by Borton Tierney, was elected to membership in the association. The Committee on Short Weights on Coal, Pig Iron and Coke, which is acting in conjunction with the committee of the New England Foundrymen's Association, reported that while its investigation had as yet not covered very much ground, it had so far found no very aggravating cases of shortages in Philadelphia territory. The committee was instructed to look into the matter further and report at the next meeting.

Hon. J. Hampton Moore addressed the meeting on the subject of the Atlantic Deeper Inland Waterways Conference, which is to be held in this city November 19 and 20, and asked that a committee be appointed to represent the association at that conference. At the conclusion of his address the president was authorized, by motion, to appoint such a committee, and named the following members: Stanley G. Flagg, Jr., chairman; Dr. E. E. Brown, H. L. Haldeman, E. H. Mumford and E. E. Durant of New Haven, Conn.

The financial situation was discussed at some length, and although it was admitted that there had been some scarcity of currency, it was said generally that no difficulty had been experienced in obtaining what was necessary to meet the usual pay rolls of the local foundrymen.

The presentation of a paper on "The Industrial Education Movement," by Paul Kreuzpointner of the testing department of the Pennsylvania Railroad, Altoona, Pa., followed. He spoke at length on the various phases of educational work, paying particular attention to the lack of technical education of the masses in this country. Abroad, particularly in Germany, attendance at the higher grade schools is compulsory, while in this country the percentage of pupils reaching the higher grades is extremely low. Industrial education is necessary, he said, from both an economic and technical standpoint, and if the industrial area of prosperity in this country is to be maintained, the education of the younger generation must be on much broader lines. Manual training aids materially, but lacks the development of talents in any particular line, as he believed should be done to bring out the best results. Elementary schools also pay insufficient attention to the fundamental principles of education. Elementary education must be better to enable the student to grasp more fully the meaning of what he is studying and to develop reasoning powers necessary to understand the technical and industrial education which should follow. The speaker was given a unanimous vote of thanks.

The Canadian Parliament.

Probably Higher Duties on Stoves and Bounties for Shipbuilding.

OTTAWA, November 8, 1907.—The session of the Dominion Parliament, which will run concurrently with the session of Congress at Washington this winter, will be the last of the existing Parliament. The last session of a Parliament has a significance that does not attach quite so fully to the last session of Congress. With a general election confronting it, the Government here is anxious to conciliate as many interests as possible. It acts on this policy to attach its friends, and also to prevent the opposition from accumulating political capital by promising to make changes or reforms which the Government has turned down or neglected. It was at such a juncture in 1904 that the Laurier Government gave in to the Canadian Manufacturers' Association and agreed to revise the tariff, and, as the result has shown, to increase the protection afforded to Canadian industries.

There are three questions which are likely to be settled at this last session of Parliament, and, directly or indirectly, they all have an interest for the iron and steel industry. The Canadian Manufacturers' Association, as was made evident at its annual convention at Toronto at the end of September last, is still dissatisfied with the protection afforded its members by the tariff of 1906-7. Canadian shipbuilders are looking for an act under which bounties from the Dominion Treasury will be bestowed on their industry, and the manufacturers of paper are demanding a heavy export duty on pulp wood to prevent its being sent into the United States, and to impel American paper makers to establish themselves in Canada if their needs call for pulp wood from the forests of the Dominion.

The Stove Manufacturers Most Dissatisfied.

It is the stove makers who are most dissatisfied with the new tariff. At Hamilton, when the Tariff Commission was there in December, 1905, they asked for higher duties to prevent American stove makers from obtaining any share of the trade of Manitoba and the newer Western provinces. The stove manufacturers then conceded that they control the trade in the territory that lies between the Atlantic and Lake Superior; but they claimed that railroad rates were against them in competing with American stove makers for trade west of the lakes, and they insisted that it was the duty of the Government to offset these disadvantages as regards railroad charges on their output by making the tariff so high that no American stoves could be imported into Canada. Moreover, they were particularly anxious that the tariff should be so amended as to exclude a range of cheap American stoves that are popular in the Canadian West.

The Government, however, refused to see the question in the same light as the stove manufacturers. It reduced the duties on their raw material as some concession to the Hamilton petition, but it refused to increase the duties on American stoves; and in this refusal of the Government is to be found the reason for the outburst of a Hamilton stove manufacturer at the recent meeting of the Canadian Manufacturers' Association at Toronto. There was much impatience at that meeting with the Government over its policy as embodied in the tariff which went into operation November 30, 1906; and it was when utterance was being given to these feelings of impatience that the head of a large stove manufacturing concern at Hamilton made a continental notoriety for himself by declaring that he would have the tariff made as high as Haman's gallows if this was necessary to keep the Yankees out.

At this same meeting the Canadian Manufacturers' Association began a new crusade for another revision of the tariff in the interest of its members. Much vigor has been thrown into the new movement. So far, however, the Government has not been scared, and, judging by the attitude of the organs of the Laurier Government in the daily press, and especially by that of the *Globe* of Toronto, which is the newspaper nearest to the Government, the Government seems disposed to turn down the request of the Canadian Manufacturers' Association for still higher duties than those conceded by the new tariff. But anything may happen at Ottawa in the last session of a Parliament, and certainly the final session is one at which the squeezing process can be brought into service with most hope of success.

The Shipbuilders.

Canadian shipbuilders stand a better chance of a concession to their demand because the Government is more than half committed to bounties for steel shipbuilding. The Provincial Government of Nova Scotia has thrown all the weight of its influence into this movement, so have the municipalities of Halifax, Dartmouth and Sydney. Usually Nova Scotia can get anything it wants at Ottawa, and there is a strong feeling that it was only the opposition of the farmers all over Canada to the renewal last session of the bounties on iron and steel that prevented the Government from doing something for the shipbuilding industry on the lakes and on the coast at the same time, as it continued the iron and steel bounties until 1912.

An Export Duty on Wood for Paper Making.

From the newspapers in which the movement has received the most support, it would seem that the Government is favorably disposed toward an export duty on pulp wood. Financiers are behind this movement who stand pretty close to the Government. Canadian paper makers are anxious for an export duty on pulp wood because of the help that it would give them in their competition with American manufacturers in Great Britain, South Africa and Australasia.

Popular support of the movement, however, has been sought by emphasizing the argument that if Canadian pulp wood were not exported American manufacturers would be compelled to set up their plants in Canada. Already about 130 American plants have been established in Canada in consequence of the tariff, the "made-in-Canada" amendments to the railroad subsidies acts and the patent laws, and the action of the Government of the Province of Ontario, which since 1897 has insisted that all lumber cut on crown lands in that province shall be manufactured within the Dominion. The argument that an export duty on pulp wood would advance the same end is being much relied on by the supporters of this newer phase of the national policy, and if the Government does not accede to the paper makers' demand in the 1907-1908 session of Parliament much will be heard of it in the canvas that will precede the general election. Canadian pride is greatly tickled by the movement across the line of so many American factories, and sentiment in favor of any scheme which will quicken this movement is easily aroused.

British Iron Ore Production in 1906.

Statistics recently published by the British Home Office show that the production of iron ore in Great Britain in 1906 was 15,500,406 gross tons, valued at £4,085,428, as compared with 14,590,703 tons, valued at £3,482,184 in 1905. The increase is 909,703 tons. The following table shows the amount of iron ore available for the furnaces of Great Britain in 1906 compared with 1905:

	1905. Gross tons.	1906. Gross tons.
British output	14,590,703	15,500,406
Foreign ores imported (excluding "purple ore")	7,344,786	7,823,084
"Purple ore" imported	524,059	569,493
Totals	22,459,548	23,892,983
Deduct exports	26,179	18,712
Net totals	22,433,369	23,874,271

Purple ore in the above table is calculated at 75 per cent. of the total cupreous iron pyrites imported, which amounted to 759,324 tons in 1906 and 698,746 tons in 1905. A statement of iron ore production in the United Kingdom for 22 years shows that the output of 1906 was the largest, the only record closely approaching it being that of 1885, which was 15,417,982 tons. The Cleveland District leads in iron ore production, its total for 1906 being 6,113,110 tons; Lincolnshire is second, with 2,357,875 tons. The Cleveland District thus shows 39.4 per cent. of the total.

Titanium in Steel and Iron.*

BY CHARLES V. SLOCUM.

I was asked to read a paper on titanium in iron, but its great effect on and benefit in steel make it somewhat undesirable for me to separate the two subjects. I propose therefore to give briefly the result of a few experiments and some little investigation concerning the improvement to both steel and iron by the use of an alloy in the shape of ferrotitanium.

This is an alloy which, in the opinion of many of the most well known metallurgists (some of whom I will quote later), is destined to revolutionize the manufacture of the more important grades of steel and iron. By more important grades I would classify not only crucible or tool steel, but steel rails, shafts for steamships, steel tires, chilled iron car wheels and all products where possible breakage involves the probable loss of human life.

Abundance of Titanium Guarantees Cheapness.

I am sanguine on the subject, not only because of the results already obtained from the use of the titanium alloy, but because the presence of titanium in high percentages in immense deposits of iron ore in mountain masses, and in almost absolutely pure state as rutile or titanic acid will inevitably make the price so low eventually as to be a mere secondary consideration.

In 1902 I bought some 10 tons or so of the American rutile, which was not only guaranteed 90 per cent. pure titanic acid, but an analysis which I had made in Pittsburgh after the material arrived showed that it actually ran as high as 96 or 97 per cent.

The iron ores of the Adirondack range contain high percentages of titanium, while many of the ore deposits of Virginia, North Carolina and some other States, as well as in Canada, Nova Scotia, Norway, Sweden, &c., are impregnated with it.

The United States Geological report of 1897-1898, part III, gives an idea of the inexhaustibility of ores in the Adirondacks high in percentage of titanium, and I was interested recently in learning that more than 750,000 tons of ore were shipped from that region this year, and more than 1,000,000 tons are booked for shipment in 1908 from the same locality.

Near Three Rivers, Canada, is a deposit of bog ore which contains considerable titanium, and is remarkable in that it is stated that only six years are required for it to renew itself—*i. e.*, you can dig out the ore to-day from a certain spot, and in about six years the sluggish waters will have left another deposit in the same spot ready to be mined again.

Superiority of Car Wheels Traced to Titanium.

It was about the year 1890 that the St. Thomas Car Wheel Company, St. Thomas, Canada, noticed a peculiarity in certain car wheels which it had been making for the Michigan Central Railroad's Canada Southern division. The workmen were unable to grind the wheels on the tread, although the emery or corundum wheels were identically the same as they had been using right along, and the hubs bored out quite freely. I remember that the superintendent stated that the wheels bored "more like cheese"—*i. e.*, less granular than usual and in no way hard. The president of the company, who resided in Buffalo, was much interested and went to St. Thomas purposely to make an investigation. He afterward wrote our A. J. Rossi as follows:

> I found that the quality of the emery wheels being used was fully up to the standard, but for some reason or another it was almost impossible to grind the chilled surface of the wheels with the emery wheels. This obtained to such an extent that I remember one wheel on which the grinding machines ran for half a day without being able to make any impression to speak of. We obtained extraordinary mileage from wheels made at the time at St. Thomas, and now have at the shops there an engine wheel which made nearly 200,000 miles and from which not one-eighth of the chilled surface all around was worn.

After careful investigation this unusual wearing quality was traced to one of the irons used which had been made from titaniferous ores.

It was about 1895 that the New York Car Wheel Works, controlling the St. Thomas Car Wheel Company mentioned, sent for Mr. Rossi and arranged to have him smelt a quantity of titaniferous ore, building for the purpose under the superintendence of my brother, A. W. Slocum, a small blast furnace, with a capacity of 3 to 4 tons per day, and in this diminutive but positive and definite manner several hundred tons of ore high in titanium were smelted. The iron obtained was a remarkably strong gray pig, made principally to demonstrate that titaniferous ores could be readily smelted in the ordinary way, if given proper attention and proper flux, and the demonstration was entirely successful.

Some three years ago Mr. Rossi went to Niagara Falls and built a small electric furnace for the purpose of experimenting in smelting titaniferous ores with electricity to obtain ferrotitanium, and was successful in making over 300 heats, necessarily small ones under the circumstances, but a number of tons of the alloy were made and samples were sent to different manufacturers and institutions for experimenting purposes, for instance, to Wm. Cramp & Sons, Abendroth & Root, Girard College, &c. I succeeded in getting some of it for the Keystone Car Wheel Company, West Homestead.

Great Strength of Ferrotitanium.

The only objection to the alloy which we found was that it was then made in thick, flat lumps, about the shape of an apple pie, but thicker. Eventually I sent a man to break some of it into small pieces to use in the ladle. He returned in the course of an hour, saying he was unable to break it. This was interesting; so with my brother, who was an athlete, and a couple of strong laborers, we hammered that lump of inoffensive titaniferous pie with a 20-lb. sledge until we were tired, but only succeeded in polishing or smoothing it slightly where the blows struck. It was necessary to use several blows of our wheel breaker (a weight of 2400 lb. falling 18 ft.) before we succeeded in our purpose. (I may add that we have had some of the alloy recently which we could not break and had to remelt it.) The results obtained in the experiments were remarkable, to say the least.

On test bars measuring 1 in. square by 12 in. between supports the transverse strength of a strong mixture averaging about 3000 lb. breaking strain was increased to 3600 lb., or 20 per cent., by using only ½ of 1 per cent. of the alloy, which in turn contained 10 per cent. of titanium, while a weak mixture made purposely for the experiment, which had a transverse strength in the test bar of 2100 lb., was increased to 2950 lb., or 40 per cent., by adding the same amount of alloy.

Practical Examples of Benefits from Titanium.

Wm. Cramp & Sons wrote Mr. Rossi that the addition of titanium to their cast iron has shown an increase of 29½ per cent. over their other cast iron and of 4 per cent. over their cast iron treated with nickel.

A large steel company, whose name I am not authorized to mention at present, had one of these lumps of titanium alloy weighing about 100 lb., when an order was received for a large steel shaft to replace a broken one for an ocean going steamer. The steel makers threw in this lump of alloy whole in the hope of overcoming difficulties they had been having with blow holes and uneven shrinkage. The shaft came out clean and smooth, very strong, and turned out beautifully, and the steamer was promptly sent on its way carrying what might be termed a successful experiment with ferrotitanium.

The Adam Bagnall Company, Cleveland, a large manufacturer of electrical equipment, is using quantities of titanium in making the pencils for electric lamps, because of the more brilliant flame obtained for the lights and the greater durability given them—a new field for titanium, but their rights are already covered by patents. It is claimed these pencils give four or five times as much light and last three times as long as the old style.

Citations from Scientists.

Titanium heated in oxygen creates an instantaneous dazzling flame like lightning. Wohler expresses the be-

* A paper read before the Pittsburgh Foundrymen's Association, November 4.

lief that there is no other known body which burns so energetically in oxygen gas.

It is generally accepted that chrome, nickel, molybdenum and tungsten add certain qualities to metal, but neither one of these elements combines with nitrogen.

Moissan says the combination of titanium with nitrogen gas is attended with the evolution of heat; that "it is the only indisputable example of the combustion of an element in nitrogen."

M. LeChatelier, professor of metallurgy in the Paris School of Mines, University of France, in his paper read at the last Congress of Metallurgists, held in Belgium in 1905, with some 1600 delegates, recommended the treatment of all steels with ferrotitanium for the purpose of purification of the metal. "The presence of nitrogen to the extent of 0.02 to 0.045 or even 0.035 in certain steels is enough to cause the metal to break asunder, destroying all elongation and reduction of area."

Dr. F. C. Weber, Chicago, says: "Titanium introduced as an alloy at once combines with the gaseous nitrogen present in the molten metal, forming a stable nitride. It is the formation of this stable nitride which prevents the formation of blowholes and thereby produces solid ingots or castings. The pipe is very much smaller and flat, not an inverted cone, because the metal being freed from free oxides and slags is more liquid, not pasty, which greater liquidity permits a more perfect subsidence in the mold or flask during the cooling down to the freezing point of the metal." He continues: "This very effective and simple cleansing of molten iron or steel makes a gray cast iron of a quality very near to that of soft steel. It makes a Bessemer steel of a quality nearly equal to crucible steel, while crucible steel is itself improved by it in every way."*

In a recent circular the latter part of this quotation was erroneously attributed to Mr. Rossi, and I make public apology for the error, which was my own.

Mr. Rossi's Work.

Mr. Rossi's work in investigating the merits and uses of titanium is so marked that to quote him would seem almost superfluous. Any one making researches to-day concerning the qualities and effects of titanium cannot fail to be impressed with the vast amount of work he has done in connection with it or relating to it in blast furnace and cupola practice, in electric smelting and in the chemical laboratory, and last, though not least, the large amount of literary work involved in recording and placing before scientists and the world in general the results of his labors. A few words in conclusion concerning the man himself may therefore be of interest:

Auguste J. Rossi is a Frenchman by birth. He was born in Paris in the last century, which, as he humorously expresses it, "sounds well and is near enough." He carried on his early studies at home until he entered the government colleges comprising the University of France. He graduated at the early age of 16 years and one month with the degrees of Bachelor of Science and Master of Arts. He then took the competitive examination necessary to enter the Ecole Centrale of Arts and Manufactures (Government School), as only a limited number are received. Succeeding in entering, he graduated three years later as civil and mining engineer at about 19½ years of age, having thus obtained four university degrees at an age when most young men are about entering college. Almost immediately afterward he came to this country and was for 12 years technically in charge of the Boonton Iron Works of New Jersey. It was during this period that titanium seems to have attracted his attention, for during the past 30 years he has devoted much of his time and a great deal of labor and money to its study and the development of methods for its use, and has taken out many patents in relation to them. The most gratifying results have been obtained by the aid of the electric furnace. Although a man well advanced in years, he is much pleased to have received from all parts of the world congratulations on the final success of a life of faithful, well directed effort. It is not too much to believe that future generations will be proud to claim Auguste J. Rossi as one of America's adopted sons who has benefited the entire civilized world.

* See *The Iron Age*, November 12, 1903.

British Steel Production in 1907.

The British Iron Trade Association has just tabulated statistics of the production of Bessemer and open hearth steel ingots in the United Kingdom in the first half of 1907. The total of open hearth steel was 2,337,794 gross tons, which compares with 2,196,853 tons in the first half of 1906 and 1,980,095 tons in the first half of 1905. The output of Bessemer steel ingots in the first half of 1907 was 1,068,972 tons, as against 919,620 tons in the first half of 1906 and 1,019,887 tons in the first half of 1905. It thus appears that the rate of open hearth steel production in Great Britain in the first half of the year was somewhat more than twice that of Bessemer steel, and this has been substantially the ratio for some years.

Dividing the production as between basic and acid steel it will be seen that in both open hearth and Bessemer steel that made on acid linings was practically two and one-half times the basic production. The figures for the first half of the year, compared with those for the first half of 1906, make the following showing:

		1906. Gross tons.	1907. Gross tons.
Acid	Bessemer	634,838	762,193
	Open hearth	1,638,667	1,682,019
Basic	Bessemer	284,782	306,779
	Open hearth	558,186	655,775
Totals		3,116,473	3,406,766

Turning to finished product the statistics show that the output of open hearth plates and angles in the first half of 1907 was 813,951 tons, as against 942,751 tons in 1906, a disappointing showing in view of the worldwide increase in iron and steel production in so many lines in the first half of 1907, as compared with 1906. The output of Bessemer steel rails in the first half of 1907 was 452,774 tons, a decrease of 34,410 tons from that of the first half of 1906. The principal products of the Bessemer steel works of the United Kingdom in the first half of 1907 were as follows, compared with those for the first half of 1906, blooms and billets being included in the classification:

	First half of year 1906. Gross tons.	1907. Gross tons.
Rails	487,184	452,774
Plates and angles	14,773	7,936
Bars (including tinplate bars)	82,961	159,307
Blooms and billets	81,745	163,127
Totals	666,663	783,144

The total number of open hearth furnaces in operation in the first half of 1907 was 392, against 375 in the first half of 1906. The average number of Bessemer converters in operation was 57, of which 35 2-3 were acid and 21 1-3 basic.

Coal Briquettes Successfully Tested.—A feature of interest in the coal trade has been the recent trial of briquettes made from bituminous coal by the navy at Norfolk, Va. It appears from the reports which have been issued that the briquettes were entirely successful as steam raisers on a torpedo boat, giving better results than raw coal. It would, indeed, be a valuable achievement if means were devised of utilizing coal slack. There are many coals, the fine slack of which might readily be made into briquettes with good results. They offer particularly good fuel for all steam uses, and this fuel can be handled most conveniently. Millions of dollars have been spent in experiments with all kinds of coal in this country, but so far without commercially successful results. This, however, need not weigh against the possibility of something being done at the present time, for progress has been made in briquetting machinery and in improving the binding material.

The Philadelphia Forge Company announces that it has installed at its works at Tacony, Philadelphia, Pa., a rolling mill department in addition to its hammer shop, and now manufactures both rolled and hammered bars in tool steel, soft steel, carbon steel and nickel steel. D. G. Gautier & Co., 20 Cliff street, New York, are sole selling agents.

Large Power Gas Engines.

A Review of Recent Experience at German Works.

An "engineering correspondent" of the London *Times Engineering Supplement* contributes an interesting article on a recent trip to a number of German works where gas power is extensively used. He starts out with a reference to the opinions expressed at one of the June meetings of the Engineering Conference in Great Britain, under the auspices of the Institute of Civil Engineers, that the large gas engine could not be regarded as having yet passed beyond the experimental stage, and that the undoubted fuel economy associated with its use must not be reckoned on as practically attainable at the present time. The correspondent considers that in view of the claim of Germany that she has working to-day gas engines aggregating over 400,000 hp., without taking into account any engine of less than 500 hp., the attitude of British engineers at the Engineering Conference calls for some explanation. Among the German works visited by the writer of the article are the following:

The Hoesch Iron & Steel Works at Dortmund, where engines (using blast furnace gas) of various sizes up to 2200 hp., of the Ehrhardt & Sehmer, Körting, Oechelhauser and Deutz types, provide power for blowing and generating electric current for general power and lighting purposes.

The Cie. des Forges et Aciéries de la Marine et d'Homécourt, at Homécourt (just over the German boundary), where three 1650 b.h.p. and two 600 b.h.p. engines generate electric current for driving pumps and other machinery.

The Stumm Iron & Steel Works, at Neunkirchen, where two four-cycle 1000 b.h.p. engines and two two-cycle engines are working coupled direct to blowers. Both these engines and those at Homécourt use blast furnace gas.

The Government works at Heintz, where 650 and 1300 b.h.p. engines worked by coke oven gas are employed in driving alternating current generators running in parallel. For these works five more engines are ordered; three of 1300 b.h.p. are in course of erection; the remaining two, of 3000 b.h.p., are not yet delivered. All the above engines are of the four-cycle type, arranged either with two cylinders, in tandem or twin-tandem.

From the comment made by the anonymous correspondent of the *Times* we make extracts below:

The manager of the Government works at Heintz estimates the cost per brake horsepower at one-tenth penny, excluding any charge for the blast furnace gas, but including all capital charges, depreciation, maintenance, &c. At the Differdingen Iron & Steel Works the manager records a saving of £75,000 a year in his coal bill, dating from the installment of gas engines. The cost of the steam plant, which, presumably, has had to be written off, is not available, but, according to reliable figures furnished to the writer, the annual saving of £75,000 would amount to not less than 15 per cent. on the new capital employed in installing the gas plant. The engines at all the installations visited were working as smoothly, noiselessly and steadily as steam engines.

A Noteworthy Installation.

As a typical example of a modern design the 2200-hp. engines at the Hoesch Iron & Steel Works may be taken. They are of the four-cycle, double acting type, and were built by Ehrhardt & Sehmer of Saarbrucken. They are notable as developing the largest power per cylinder of any engine yet made. The cylinders, two arranged in tandem, are 1150 mm. in diameter, and the stroke is 1300 mm. Speed of revolution, 94 per minute. The overall length is about 60 ft., and they are coupled direct to 1600-kw. continuous current dynamos which are running in parallel. While the engines are of mammoth proportions, they are free from all appearance of complication. [The Ehrhardt & Sehmer engine was described in *The Iron Age* of August 9, 1906, page 344, and the details that follow are therefore omitted.—EDITOR.]

The enterprise of Germany would appear to be justified in view of the fact that a number of repeat orders are now in course of execution for works which have had a sufficient experience of the working of this class of motor.

Failures in British Practice.

Circumstances have combined somewhat unfortunately in this country to place the large gas engine under a cloud. There has been the failure of the Johannesburg installation, a partial and temporary failure no doubt, but, as the plant cannot be put into service, the effect commercially is to give a check to the growth of confidence, which led to its adoption in this case. There have been other setbacks in which faulty design, arrangement or construction have led to considerable financial loss. Engineering firms which have inaugurated the manufacture of these engines in this country have been somewhat discouraged by the difficulties and failures they have encountered, and progress has been arrested in consequence. It is clear that some course must be taken to re-establish confidence before much can be done. The dominating cause, however, of the inaction in this country at the moment is perhaps embodied in a remark made in the presence of the writer by Herr Sehmer of Ehrhardt & Sehmer. He expressed his belief that English engineers would have done all that German engineers have done had they received in England the same encouragement German engineers had recived in their country from the German ironmasters.

The complete success of the gas engine up to powers of about 5000 hp. must be regarded as having been demonstrated in Germany, and England's best policy would appear to be to acknowledge Germany's lead and to make the best possible use of it by either importing experienced German engineers or by installing a sufficient number of German built engines to provide practical and readily accessible examples of all that Germany can do in this direction. It is estimated that in the United Kingdom over 1,000,000 hp. are being continuously dissipated by blast furnaces alone. The position is roughly this: A 150-ton blast furnace will supply 2000 hp. when the gases are utilized for gas fired boilers in accordance with the usual practice, but if utilized by gas engines 6000 hp. can be developed, thus affording a large margin of power available for blowing, transport, lighting and rolling.

The Field for the Producer.

Iron works and like installations furnish at the present moment the most important field for the use of gas engines, but there is opening out a much wider field in the demand for cheap power for driving the machinery of factories, electro-metallurgy, and the general supply of electrical energy. These applications involve the use of gas producer plants, since blast furnace and coke oven firms, after their own needs are satisfied, could only meet the demand in the neighborhood of their works. It cannot be said that Germany is ahead of England in the development of gas producers, but in neither country has complete success been attained. The arrival of the large gas engine has emphasized the need of an efficient producer, and a great reward awaits those who contribute to its improvement. The difficulties experienced with producers are not insuperable, and are questions rather of niceties of adjustment and regulation than of the removal of any radical defects.

Four Cycle and Two Cycle Engines.

While the large gas engine is now a commercial success it cannot be regarded as having reached finality. There is still a division of opinion among German engineers as to the relative merits of the four-cycle (Otto) and the two-cycle engine; and in some works it is common to see, as pointed out above, both types installed. The two-cycle engine, with its single cylinder, might be expected to be more compact, but in practice it is not so, owing to its increased length of stroke, and there is no saving in material. The charging pumps contribute a heavy and somewhat bulky appearance to the two-cycle engine, and the additional necessary mechanism gives an appearance of some complication. As regards efficiency, the four-cycle type has a small advantage, and its run-

ning is more uniform. This is an important feature when the engines are destined to drive dynamos working in parallel, but for blowing engines it is of no importance. The greater regularity of speed is, in the case of the four-cycle engine, secured by the governor acting directly on the charge as it is admitted to the cylinder, whereas with the two-cycle type the governor must act on the charge as it enters the pumps, and an element of delay is thereby introduced which affects the prompt control of the engine.

Some further improvement may be looked for by the wider use of "scavenging"; the output of an engine may be increased by some 20 per cent. by having recourse to this method of removing the inert products of combustion. There is not much, if any, gain in efficiency, but the first cost for a given power is substantially reduced.

The Flag Pole Surmounting the Singer Building.

JOHN P. SLACK.

The 45-story Singer Building, New York, represents the supreme test of the builders' art so far as skeleton steel construction is concerned. Before the lofty tower was reared to its present eminence, the trials and problems of the builder were many. Now that the work of inclosing the gigantic cage within its shell of stone and brick is well under way, all difficulties in the building of the skeleton frame seem to have been safely surmounted. The crowning feature of the achievement—viz., the placing of the 90-ft. steel flag pole which surmounts the dome—gave not a little trouble to the contractors before its base was safely in position at the forty-third story.

Composed of hollow steel tubing, the pole is imbedded for 30 ft. of its length in a specially constructed steel pocket extending from the forty-third floor to the top of the tower. The portion extending beyond the tower is 60 ft., or two-thirds of its total length.

At the forty-third story is a 10-ft. length of steel tubing, its dimensions 9¾ in. inside by 10¾ in. outside. This is fitted at the bottom into a wrought steel shoe 18 in. square. This portion of the pole projects through the forty-fourth floor, and is screw joined into a 20-ft. length of smaller piping, thus bringing the socket of the pole 3 in. outside of the outlet ring, which forms the highest part of the dome structure of lantern surmounting the main structure. At this point the slip joint occurs, telescoping 9¾ in. outside by 8¾ in. inside, into the 10-in. socket for a distance of 2 ft. 6 in. From there above the pole is in five sections, 60 ft. overall, and tapers from the 9¾ in., before mentioned, to an ultimate 5⅝ in. The four joints are accomplished by shrinking the larger over the smaller size piping for a distance of about 20 in. In addition, each joint is tapped and bolted. At the top the pole is closed by means of a ball bearing truck mounted on a cast iron reducing coupling into which the king pin is screwed.

The body of the cast iron truck containing the 2 x 4¾ in bronze sheaves revolves about the king pin on two steel ball bearings to provide against the flag wrapping itself about the mast. The body of the truck is surmounted by a ¾-in. galvanized iron rod, 3 ft. long, to the top of which is attached a 12-in. copper ball. The total weight of the pole is, approximately, 3 tons, or 6300 lb.

A difficulty confronted the contractors in turning over to the owners a steel flag pole, in position which they could guarantee as exempt from the effects of rust and corrosion. While ordinarily it would be an easy matter to paint a steel pole before placing it in position, this could not be safely done in the instance of the Singer Building, since in hoisting the huge pole to its ultimate destination, severe scratching in transit would have been inevitable. Such damage would have warranted considerable doubt as to its being fully covered with protective material when finally in position.

Furthermore, the action of the elements at this hight —612 ft.—was an unknown factor as far as steel flag poles were concerned. Therefore it was not deemed advisable to rely upon ordinary methods of giving the pole a coat or two of metallic paint, trusting to chance for results. The paint on steel poles erected at a considerably lower hight than that of the Singer Building has been known to blister, due to the action of the sun's rays; then freezing weather, depositing its layer of icy coating has removed portions of the blistered paint, thus leaving the steel beneath exposed to the action of the elements with resultant deterioration.

At such an unobstructed hight wind pressure is a grave factor. With corrosion at or near the base of the column a high wind might result in the huge steel pole being precipitated hundreds of feet, crashing through buildings or being hurled into the street below. Public safety is a weighty factor in any decision regarding the construction details of a building of such huge proportions. In the instance of the pole above the Singer Building it was not deemed advisable to take chances.

These provisions were necessary to obtain safety: First, that the pole be covered with a protective coating after being placed in position; second, that the effectiveness of the material chosen as a resistant to atmospheric conditions of all sorts be absolutely dependable. The first requirement was not easily met, since the ordinary steeplejack was found to be disinclined to accept a commission involving such danger as painting a flag pole 60 ft. high, 612 ft. above the ground. Ultimately, E. Capelle of New York, a steeple climber of much experience, was found willing to undertake the work. For a material which would meet the requirements mentioned above, Voltax, an anti-corrosive compound made by the Electric Cable Company, New York, was chosen. Since it is impossible for corrosion to exist on a steel surface coated with this preparation, it remained only for Mr. Capelle to apply it to the surface of the Singer Building pole.

Owing to the difficulty in this instance, of manipulating the compound in its ordinary consistency, because of the insecure position of the workman, it was deemed advisable to dilute it from its thickened state and to apply five coatings in its diluted form to insure proper protection.

In performing the feat of applying the compound Mr. Capelle had a most interesting experience, and his statement of the conditions which obtained are of more than passing value. He states that the wind velocity at such a hight ranges from 10 to 40 miles an hour at times when lower air currents show no appreciable velocity. With a stiff breeze blowing below, 40 to 80 miles an hour may be registered above. In the latter case the top of the steel pole sways in a radius of about 1 ft. This movement, contrary to general impression, is an indication of strength. If the tensile strength of either a steeple or a flag pole does not admit of a certain flexibility, high wind pressure is a dangerous factor. Instances are on record where both steeples and poles have been broken off by reason of lack of elasticity with which to accommodate them to varying wind pressure.

Acting at the earnest solicitation of influential importing interests, J. H. Edwards, Acting Secretary of the Treasury, has granted an extension of 48 hr. to the 48 hr. permitted by law for the payment of customs duties. The law insists on payment in gold coin, silver dollars, gold and silver certificates and treasury notes. The relief was demanded on the ground that the present disturbed financial situation makes it exceedingly difficult for importers to secure currency in time to meet their obligations to the government.

Founder's Day at the Carnegie Institute, Pittsburgh, will hereafter be celebrated on the last Thursday in April of each year. The entire Institute Foundation is to be incorporated. These changes were decided upon by the trustees of the Institute last week. Changing the date of Founder's Day from November to spring came through a suggestion of the Fine Arts Committee, it being considered more favorable for both the collection of canvases for the international exhibition of paintings and for the public appreciation of them.

New Car Demurrage Rules.

BY R. L. ARDREY.

The American Railway Association at its recent semi-annual meeting in New York adopted a new code of standard car demurrage rules, which will be laid before the various car service associations throughout the country with a recommendation that present rules be amended to conform with them. As the American Railway Association is composed of and speaks for the highest executive officers of all the important railroads of the country, this recommendation will be equivalent to a command to the officials in charge of the local car service bureaus, and the new rules will, therefore, go into effect in the very near future.

Exceptions from the New Rules.

All cars held for shippers or consignees for loading, unloading, forwarding directions or for any other purposes are subject to demurrage, with the following exceptions: Cars loaded with railroad company material, live stock, private cars on tracks of owner, cars with through consignments not stopped in transit or held for orders, cars containing coal or coke shipped to a port for delivery directly to vessels or to be stored for shipment by vessels, empty cars placed for loading at coal mines or mine sidings, or coke at coke ovens, and empty cars held by railroads for prospective loading.

Forty-eight hours' free time will be allowed for loading or unloading all commodities. Twenty-four hours' free time will be allowed when cars are reconsigned, held for final or amended instructions, held for payment of freight before delivery to connections or held with freight in bond for Government inspection.

Industries which do their own switching or which operate private terminals are only allowed one day for switching, in addition to the regular free time for loading or unloading. This is perhaps the most important change from existing rules, as shippers of this class, of whom there are a great many in the iron and steel trades, have generally had two days or more for switching.

Export shipments on export bills of lading are exempt from demurrage at the seaboard. Cars containing freight consigned on local bills of lading to ocean, gulf or lake ports, for coastwise or export movement by vessel, will be allowed a maximum of 96 hr. free time, provided the terminal agent is notified within 48 hr. after arrival that such disposition will be made. The railroad reserves the right to unload the cars and store the lading at the expense of the owner at such time as it may see proper after the expiration of the free time.

The free time is computed from the first 7 a.m. after cars are placed for loading or unloading, either on private sidings or public delivery tracks, or on the interchange tracks of minor railroads or private terminals.

The consignee shall be promptly notified upon the arrival of cars at their destination, or, if stopped in transit, upon their arrival at the place of stoppage. Delivery of cars on private or interchange tracks constitutes notice.

"Constructive" Delivery or Placing of Cars.

When delivery of cars consigned or ordered to private tracks cannot be made on account of the inability of consignee to receive, delivery will be considered to have been made when the car was tendered. Agents are required to give notice in writing to make this constructive delivery effective. This rule applies to insoming loaded cars, as well as to empties ordered for loading. When delivery cannot be made on specially designated team or public tracks on account of such tracks being fully occupied, or from other cause beyond the control of the carrier, the delivery may be made at the nearest available point.

The Rule on Terminal Embargoes.

When a railroad is unable to receive cars in switching service tendered by a connection to be placed for delivery, owing to the inability of the consignee to receive, it will promptly notify the line offering, in order that notice may be given the consignor or consignee and other disposition requested. Notice will be promptly given the consignee by the road offering the car and 24 hr. allowed the consignee for its disposition.

Claims for Refunds or Relief.

No claims will be allowed for canceling or refunding demurrage charges, excepting for weather interference within the period of free time, delayed or improper notice, or railroad errors or omissions. This rule on claims is a very strict one. The present rule in the Pittsburgh District is as follows:

> Reasonable allowances will be made in cases of strikes, fires, floods, breakdown of machinery or other conditions beyond control; the allowances to be made after investigation and in accord with the actual conditions surrounding, inclusive of diligent effort on the part of consignor or consignee to release the cars. The allowances, if possible, are to be made in advance of the payment of charges. Where that cannot be done, bills should be paid by the consignee or consignor and claims promptly made, to the end that prompt consideration may be given.

"Average" Demurrage Not Favored.

No provision is made in this new code for "average" demurrage, nor for relief to the shipper when cars are "bunched" by the railroad. In the Pittsburgh District the carriers have voluntarily established a bunching rule which has been very important to the large shipping industries in that territory. Each plant is rated at its daily capacity, and is not required to unload more than 50 per cent. in excess of its rating, when cars are delayed in transit and bunched in delivery.

In New England, Ohio and Michigan two-day average rules are now in effect, allowing the shipper an average time of two days on each car received or loaded during the month, without regard to the time taken on an individual car. In Michigan three days' average time is allowed on coal, coke and some other commodities. In Ohio the two-day average plan is provided for by the rules of the State Commission, which were accepted by the railroads and put into effect October 1. The shipper, wherever average rules are in force, has the option of working under the average plan or under the old rules.

To Be Rigidly Enforced.

The new rules will be filed with the Interstate Commerce Commission as tariffs by the various car service or car demurrage associations, and also by the railroads, and this will necessitate a rigid enforcement on the part of the railroads. The commission holds that it is unlawful for a railroad to refund or cancel car service charges, except in those cases which are specifically provided for in the rules. In former years many large shippers of iron and steel were practically exempt from car service or demurrage rules through the favor of railroads which solicited their business, but this condition will not prevail in the future.

The question has not yet been settled by the courts whether interstate rules, filed with the Interstate Commerce Commission, take precedence over the rules of State commissions, where there is a conflict in the free time allowed or in other conditions. There was a spirited discussion of this question in Ohio the past summer, but it did not get into the courts for final settlement. The Ohio State Commission allowed the consignee three days to unload cars containing more than 66,000 lb. The railroads for a time objected to this, and filed rules with the Interstate Commerce Commission, which limited the free time to two days on interstate shipments. The roads finally accepted the State rule and amended their interstate tariffs to take effect October 1.

The New York, New Haven & Hartford Railroad has announced the intention of observing the State law of Connecticut, which allows four days for loading, unloading or reconsignment. This will complicate the conflict in New England between the four-day rules now in force and the new "standard" code.

The corn crop of 1907, according to the Department of Agriculture, totals 2,553,732,000 bushels, against 2,927,416,000 bushels in 1906. The crop of 1907 was also slightly under that of 1905, but larger than for any previous year.

THE IRON AGE

Established in 1855.

New York, Thursday, November 14, 1907.

Entered at the New York Post Office, as Second Class Mail Matter.

DAVID WILLIAMS COMPANY, - - - - - - PUBLISHER
14-16 PARK PLACE, NEW YORK

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CHARLES KIRCHHOFF, - - - - - VICE-PRESIDENT
RICHARD R. WILLIAMS, - - - - TREASURER
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The Tennessee Company Purchase.

The latest example of concentration in the iron industry differs from practically all similar transactions in being a result of adverse conditions All the consolidations now so familiar in the American iron trade were born when the tide of prosperity was rising or running at its flood. In the present case the negotiations were begun as a measure of relief from financial distress already acute and that threatened to demoralize both security and commodity markets. Signs of curtailment were increasing at iron and steel works, and manufacturers everywhere were seeking to increase their liquid resources rather than entertaining proposals to take on new properties. The Tennessee Company-Steel Corporation deal is unique, moreover, in that the chief motive on both sides was that of saving a situation that had unpleasant possibilities. The corporation was not actively seeking Alabama or any other properties. On the other hand, the majority holders in the Tennessee Company were satisfied with their investment, had shown their faith in it by spending millions of fresh capital in improving their plant in the past two years and were confidently looking to the future to justify their foresight.

The estimate of the ore situation in the United States on which was based the Hill ore deal, then pending and as good as closed, doubtless had much to do with this entrance into the Southern field of men who had had long experience in iron and steel manufacture in the North. Time will demonstrate whether undue stress has been put on the possibilities of an ore scarcity, in the scale of values fixed for Lake Superior and Southern ore properties in the past two years.

It has been commented on as one of the anomalies of the times that in the midst of a political régime marked by the rigor of its attitude toward consolidations one of the fruits of the recent unsettlement of finance and business should be a further concentration. Perhaps in the balancing of the arguments for and against consolidations this event of the past week will be set down on the credit side. The steadying influence of large interests on iron and steel markets has already been recognized. There is now added a demonstration of the service that can be rendered in a critical time by a great corporation that has wisely husbanded the earnings of prosperous times.

The entrance of the Steel Corporation into the Southern field means less revolution in methods and management than would have been the case a few years ago. For nearly two years active construction and reconstruction work on Northern lines has been under way in all departments of the Tennessee Company's operations, and before the last management took hold much had been done in the introduction of improved methods, though the handicap of old plant was always present. The Steel Corporation comes into possession just as the new steel plant is starting up, and the new rail mill will soon add greatly to the finished output. The syndicate that bought control two years ago was welcomed by the South as able and progressive and with abundant means to develop the property. Similar expectations are entertained to-day, with the added certainty that the Tennessee Company has seen its final change of control. Judging from the policy that has marked the handling of its other properties, the Steel Corporation's régime in the South should count on the side of progress, stability and the largest development of its resources.

It should hardly be necessary to say that the large addition to the Steel Corporation's ore reserves made by the late transaction, on which there has been some comment, has no significance in the strengthening of its ore position in the North. It may turn out that less Southern pig iron than formerly will find its way North, and the competition of Southern steel in Northern markets may be less than under the old régime. That tendency was already apparent. But it may be more marked in the future as the South grows in ability to consume its own products and as the export machinery of the Steel Corporation becomes available in furnishing an outlet for its Southern works.

Concentration in Machine Manufacture.

Carnegie's advice to "put all your eggs in one basket and then watch the basket" finds no more practical illustration than that presented by the shop whose product is limited to a single type of machine, or, better still, to a single size of that type. Such concentration of interest and effort affords unequaled opportunities for economy in production and superiority of product. It can hardly be questioned that it is far better to make 1000 machines of one size than 100 each of 10 sizes. Even in this day of multi-combinations this fact is not overlooked; it is evident in the existence of many independent manufacturers of individual products. But it is displayed with great prominence in the machine tool field, where, even under undivided ownership, different products are in numerous cases manufactured in independent shops. In a few notable instances distinctive machines are built in large quantities, in one or few sizes, and under an intensive system that is showing remarkable results.

To one accustomed to multiplicity in product, the equipment, organization and methods of such a shop are suggestive. The ratio of a single draftsman and perhaps a single pattern maker to hundreds of machinists is so out of the ordinary as to attract immediate attention. And yet the proportion is logical and typical of the economies possible in such a shop when the design has become well established. Drawings are standardized, their number is relatively small, a change in detail affects perhaps but a single drawing, rather than a series relating to a full line of machine sizes. Patterns likewise are not numerous. They may wisely be of metal, thereby reducing repairs to a great extent; they may be adapted to reproduction on the molding machine because of large quantities of similar castings required. For the same reason the maximum economy may be secured in the use of jigs and templates, for their variety will be limited and their use continuous. In fact, in every process these conditions tend toward economy in manufacture. Less variety in machine tool sizes is required, but

each type may be continuously employed for certain operations to which it is best suited.

Multiplicity in pieces of a kind, as distinguished from multiplicity of kinds, conduces to economy in every direction—in general administration, in the purchasing of material, in its storage, in the total value of supplies required to maintain a given percentage of surplus per kind, in specializing of operations, machines, tools and operatives. There is decreased dependence upon the single operative, accustomed to specific work, for the magnitude of similar work requires the training of others, all becoming equally skilled in the given operation. Unless self-satisfaction becomes supreme, concentration in manufacture must tend toward perfection in product. Its defects are more readily noted; they receive more careful consideration because they are not confused with those in other products; they are more easily and quickly and withal more willingly remedied than would be the case if a full line of sizes or types was concerned. Commercially the individualized product should sell more readily, and at same time yield a larger profit per machine than the product of a shop with diversified interests.

Specialization in many cases lends itself to isolation of plant; to the maintenance of the country shop, with experienced employees who have seen long service, who own their own homes, and who have but little interest in the controversies between capital and labor. In such a community employer and employees are brought into closer personal touch and there is greater mutuality of interest; more of the home and less of the saloon. The raw material from which the best machinists are made is at hand, as yet uncontaminated by city associations.

The salesman and the demonstrator for a single size of machine, like every other man from the president down, attain higher efficiency because of concentration. Only one thing is to be learned, and that can be learned to perfection. There is no confusion of interests, no doubt as to what a given machine will do, just a clean cut understanding of one thing. Maximum individual ability is the natural result. There is ready interchangeability of effort. There need be no departmental system with its deadly lost motion. In the line of publicity every medium directs toward the one focal point—the specific machine. The advertisements talk about one machine and its work; the catalogues describe but one machine; the correspondents quote upon only one machine, and the salesman has but one story to tell when he goes out to sell it. The advertisement contains no list of other products; there is no alternation of various products in successive advertisements. No general catalogue, or special individual bulletins are required; the product becomes synonymous with the name of the manufacturer, the one always suggests the other.

Such are some of the advantages of concentration of the individual product; advantages which under ordinary conditions appear to far outweigh any possible results from diversity in products, even though they be concentrated in manufacture and sale.

The Foreign Fear of American Steel Exports.

Since the formation of the United States Steel Corporation there has been a strong feeling on the part of foreign iron and steel producers that the first serious decline in the domestic demand would be the signal for a strenuous effort on the part of the corporation to capture foreign markets. At the outset, at least, our foreign friends do not seem to have taken seriously the claims that definite and important values had been written by the march of events upon our mineral reserves of iron ore and good coking coal. Familiar as they were with their own dumping policies and with the example before them of our Southern iron producers in 1897-8, it was easy for them to reach their conclusion. In the past year or so this feeling appears to have been slightly allayed; at any rate, it has not found such definite expression in the public prints. Possibly the toning down has come in part from the better prices the American producers have succeeded in getting in foreign markets, and perhaps also quiet assurances have been given by those in position to speak.

The fear abroad of the inauguration of a very aggressive export policy by the United States Steel Corporation has produced feelings akin to consternation, but thus far there has been no evidence of an export movement such as has been feared, and there is little in an analysis of the situation to warrant the fear. Export statistics through September are available, and they do not show any material increase of late, although there has been decreased pressure in the domestic market for several months. There is the further fact that no evidence has appeared that in the past few months any greater effort than formerly has been made to book export business. As to billets and sheet bars, a definite statement was made within the past month that for more than six months no sales at all were made, while the mills have been cleaning up old orders, deliveries upon which should have been made many months ago.

Recurring to the showing made by recent statistics, the following statements may be made: The total iron and steel exports in September were slightly less than in either July or August. The total exports in the three months, July, August and September, were but 45,000 tons, or 15 per cent. in excess of the average quarterly exports during the first half of the year. The total exports in the first nine months of this year were 976,196 gross tons, against 1,021,833 tons in the same nine months of 1906, a decline of 4½ per cent. September, 1907, exports were 115,869 tons, against 89,352 tons in September, 1906, decreases being shown in bar iron, billets, plates and wire, and increases in steel bars, iron sheets and plates, steel rails, structural material and pipes and fittings. This mixed evidence tells no clear story such as should be told by this time had a definite policy been outlined in advance of supplanting domestic with foreign business the moment the former began to fall off.

When in 1903 pressure for material in the domestic market fell off after much the same fashion as has been seen lately, there was a sudden increase in exports, the total more than tripling from one year to the next. It was not unreasonable for this increase to be interpreted as a dumping process, to be dropped when domestic demand revived, but time showed that the view was incorrect, since once acquired this foreign trade was continued after the domestic demand had become heavy. Following is the record of total iron and steel exports by calendar years:

Year.	Gross tons.
1902	372,398
1903	326,655
1904	1,167,710
1905	1,010,255
1906	1,325,157

Allowance should be made for the fact that in 1906 the government statistics included 141,784 tons of pipes and fittings, which item was not returned for previous years. To compare totals the 1906 figure should therefore be taken at 1,183,373 tons, whereupon there appears the most striking similarity between the totals in 1904-

5-6, although this period covers one very lean year and two very good years. In 1904 exports were more than three times as large as in 1902 or 1903, with domestic demand so poor that total pig iron production dropped 1,500,000 tons below the two preceding years. The testimony of the previous depression, then, is that such a period may induce heavier exports, while it is not that such export trade is of such a nature that it will be dropped upon the reappearance of heavier demand at home.

In essence the mission of the United States Steel Corporation is to convert into cash vast mineral resources which have been capitalized and which have received definite values through aggregated ownership and through the progress of knowledge which has disclosed more clearly the limits to ore and coking coal reserves. It is the object of the Steel Corporation to convert these minerals into cash when it can do so profitably, and to conserve them, when it cannot, for future use. Even if the lessons of the past have not shown greater fluctuations in values in iron and steel products than are likely to occur in the future, the lessons have been sufficiently convincing that there is no advantage in frittering away any of these minerals for the sake of keeping the wheels going round. Those outside the Steel Corporation who control Lake Superior ores have become imbued with the same feeling, and it is hard to believe that these firmly held views as to the value of raw materials will undergo essential modification in the greatest adversity that may overtake the trade; that there will ever again be the drop in Lake Superior ore values which occurred from 1892 to 1894, when there was a decline of about $2 a ton at lower lake ports, a decline in percentage at such points of between 40 and 50 per cent., and a decline at mines of a much larger percentage.

The value of exports as a means of bridging over the valleys in domestic demand has been popularly overrated. This is a 27,000,000-ton country, measured in terms of pig iron, while exports have barely reached 1,500,000 tons, measured in the same terms. By a slow process some demand can be created in foreign markets, but such exports from the United States as have been feared abroad could represent nothing but the taking of export trade from other countries or the invasion of their own home markets. In 1906 the total exports of all countries, excepting the United States, amounted to only about 12,000,000 tons, in terms of pig iron, and a considerable part of this was merely the interchange of commodities of different form. Conditions abroad make foreign producers more anxious than formerly to hold their trade. Where demand in the United States may vary by millions of tons, exports can at best vary but by hundreds of thousands.

That the use of electric locomotives in the Simplon Tunnel has been abandoned, as stated in *The Iron Age*, September, 5, 1907, page 625, is contradicted by Brown, Boveri & Cie., Baden, Switzerland. It is further stated that the second tunnel now in process of construction will also be operated electrically. The difficulties mentioned in the item referred to, it is claimed, have already been overcome.

The Scully Steel & Iron Company, Chicago, has found its Eastern business growing to such proportions as to make it necessary to open an office in New York City. The office is located in the United States Express Building, 2 Rector street, and W. H. Baker is manager. The company deals in plates, tubes, sheets and other iron and steel products as well as machinery for boiler makers and others.

CORRESPONDENCE.

Cash Payments for Pig Iron.

To the Editor: A few weeks ago (October 24) you were kind enough to publish a letter which I wrote you concerning pig iron credits. As a manufacturer of pig iron, it seems to me that this is a subject worthy of very serious consideration. Recently I have had several letters from consumers stating that they could not pay cash as agreed upon in the contract, but would send their four months' paper, and if this settlement was not satisfactory to cancel the balance due them, as they would be obliged to buy from others who would extend them time accommodations. There were no "ifs and ands" or "by your leave" in the letters. They were direct and to the point—either take notes or quit.

At a time like this, of course, money is exceedingly tight and all collections are slow, but a cash contract is a cash contract, and it shows an amazing spirit in business men to regard a contract obligation so lightly. Letters stating that payment could not be made on the date fixed, but would be made as soon as possible and explaining the reasons, would have been received in the spirit in which they were sent, but letters of the character I have described almost drive one to the conclusion that there is a great lack of business honor in the country. I am too sincere an optimist to believe anything of this kind, but I do believe that a great many manufacturers do not understand the underlying principles of credit.

In my younger days we used to sell pig iron on 24 months' time; later on, six months' time, and in those days failures were frequent and business was risky and uncertain. Business to-day is supposed to be on a cash basis. There is certainly no other safe way of doing business.

The odd thing that I found about the men who ask now for long time is that they seem to think they are doing one a favor in buying from him, and they demand prices on the same basis as those paid by the prompt cash customers. I believe the time is coming when in self-defense the iron makers of this country will be forced to divide the cash customers and the time customers into two classes and will charge the latter a premium for the privilege of paying in paper.

AN IRON MANUFACTURER.

The Iron Buyers' Association.

Representatives of 40 concerns of the Middle West, principally from Dayton, Springfield, Columbus, Cincinnati, Hamilton and Middletown, Ohio, met at the Phillips House, Dayton, November 7, and organized the National Iron Buyers' Association. William Fetzer of Fetzer & Co., Middletown, was elected president; William Gugenheim of Mast, Foos & Co., Springfield, treasurer and secretary, and the following were elected vice-presidents: Theo. Bollman of the Bollman-Wilson Foundry, Cincinnati; A. F. Sparks of James Leffel & Co., Springfield; G. H. Gorman of the Davis Sewing Machine Company, Dayton; George M. Verity of the American Rolling Mill Company, Middletown; L. Kahn of Kahn Bros., Hamilton. These officers constitute the Executive Committee and they will soon name a special committee of five members to take up the matter of freight rates from the Birmingham District. Another committee of five will be named to formulate a uniform contract covering forward deliveries, analyses of iron, &c., and agreements between manufacturers and jobbers. Commissioners E. E. Williamson of the Cincinnati Receivers' and Shippers' Association and Walter B. Moore of the Dayton Association made addresses. The date for the next meeting was left to the judgment of President Fetzer, and Dayton will be the permanent headquarters of the new association.

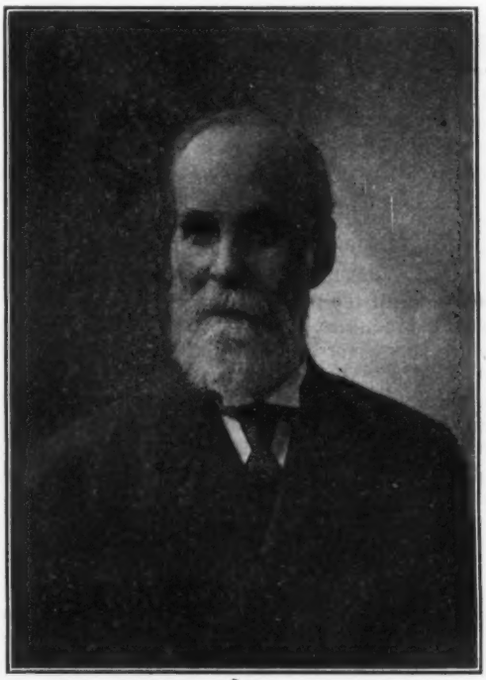
The Bethlehem Steel Company, South Bethlehem, Pa., characterizes as absolutely untrue the widespread report that it is negotiating for the blast furnaces and other property of the Lackawanna Steel Company at Lebanon, Pa.

OBITUARY.

Thomas Hobson.

Thomas Hobson, for many years connected with the David Williams Company as manager of its Philadelphia office, died November 9, aged about 75 years. He was born in England, where he was brought up to the provision trade. In 1860 he removed to Montreal, Canada, where he found employment in his old line of business. Becoming connected as salesman with a large wholesale house, he saw an opportunity for finding a market in Great Britain for Canadian dairy products. Previous to that time Canadian butter and cheese were hardly known in British markets, but the work done by Mr. Hobson attracted immediate business. This trade, of which he was undoubtedly the pioneer, now amounts to nearly $50,000,000 per annum, and has placed Canada in the first rank as a producer and exporter of these commodities.

Coming to the United States, Mr. Hobson became connected with the publications of David Williams in 1875. He opened the Philadelphia office at a time when some



THOMAS HOBSON.

little work had been done in specially cultivating that field for *The Iron Age*. This, however, was the first actual branch office established for the David Williams publications. The planting of a branch office was an experiment and much depended on the outcome of the first undertaking of this kind. The Philadelphia office, however, soon justified its establishment, and its success led to the placing of agencies in other large cities. It was fortunate in having for its first manager a man whose methods were so dignified and straightforward as to place the solicitation of trade paper advertising on a higher plane than it had previously occupied in the estimation of the general public.

While Mr. Hobson proved himself an adept in handling advertising and other matters connected with the business side of our publications, he had a natural tendency to study questions connected with markets. This disposition led him at an early day to undertake the preparation of a weekly report on the condition of the iron trade in Philadelphia and its vicinity for the columns of *The Iron Age*. It may be said that he was the originator of practical and definite market reporting in the iron and steel trades. The market reports to-day are conducted on the lines thus laid down. His reports attracted attention from their very beginning, and, until incapacitated a few weeks ago by the illness which terminated in his death, our Philadelphia iron and steel report was regularly his work. His powers of analysis of trade courses, currents and tendencies were far above the ordinary, and his ability to forecast the course of prices was only equalled by his ripeness of judgment in guarding against the commission of errors into which market reporters are so frequently liable to fall. He was a man of conscientious devotion to duty and may be said to have literally died in the harness.

J. CHRISTOPHER HITZEROTH, Philadelphia, Pa., died November 7, aged 77 years. He was well known in the foundry trade, having established the Novelty Iron Works in West Philadelphia, which he operated for a number of years.

TOD FORD, a former well known steel manufacturer at Youngstown, Ohio, but for some years a resident of Pasadena, Cal., died in the latter city November 4, from apoplexy. He was born at Cleveland, Ohio, October 21, 1854. He studied law and was admitted to the bar of Mahoning County in 1876, but practiced law only a short time, owing to the fact that his uncle, John Stambaugh, required his services in the management of large interests. This began a business career in which he displayed remarkable ability. He was identified with nearly all of the important business enterprises of the Mahoning Valley and had other large interests elsewhere. At the time of his death he was the president of the Youngstown Steel Company. About 10 years ago his health failed. He leaves two sons, his wife having died in 1889.

LEOPOLD FRAUNEDER, ornamental iron manufacturer, died at Oakland, Cal., October 28, aged 62 years. He was a native of Germany, but embarked in manufacturing at Oakland 30 years ago. His son, Cornelius, has of late conducted the business.

JOHN C. DUEBER, president and founder of the Dueber Watch Case Mfg. Company and of the Hampden Watch Company, Canton, Ohio, died November 6, aged 65 years.

EDWARD C. GWYN, Springfield, Ohio, died November 1, aged 52 years. He was born near Springfield and received his early business training under his father, who was a contractor engaged in the installation of gas and water works, operating all over the country. The son was superintendent of construction of the Springfield water works, afterward serving as president of the Board of Trustees. In 1886 he became associated with John J. Hoppes and organized the Hoppes Mfg. Company, of which he was secretary and treasurer until he disposed of his interest in 1892 and organized the Safety Emery Wheel Company. He served as treasurer and manager of that company until his decease. He was interested in many other local enterprises, including the Lion Hardware Company. He was active in church work as well as social affairs. He leaves a widow, a son and a daughter.

JOHN RICHARD REED, Westfield, Mass., president of the H. B. Smith Company, manufacturer of boilers and radiators, died November 11, aged 75 years. He was born in Ware, Mass. When 20 years old he went to sea and for three years was in the northern Pacific and the Arctic oceans. He entered the employ of the H. B. Smith Company 48 years ago, and his success was such that when the business was reorganized in 1878 he was made president and general manager, and he remained head of the business until his death. It was largely due to his ability as an inventor as well as a manager that the business has grown to its present large size, with 800 men on the payroll. He was a member and for years a deacon of the First Congregational Church of Westfield, was a trustee of Westfield Academy, a director of the Westfield Atheneum and an incorporator of the Westfield Y. M. C. A., and was generously active in charitable work. He was twice married, and leaves a widow and five children, of whom Richard D. Reed is prominent in the management of the H. B. Smith Company.

At the Riverside plant of the National Tube Company, Wheeling, W. Va., blast furnace B in October made 14,228 gross tons of Bessemer pig iron against 13,530 tons in May, its best previous record. The output of tubular goods in October was 13,668 tons against 13,486 tons in May, the best previous record.

New Directors of the Tennessee Company.

In view of the purchase of a controlling interest in the Tennessee Coal, Iron & Railroad Company by the United States Steel Corporation, a special meeting of the directors of the Tennessee Company was held at 115 Broadway, New York, on Saturday, November 9, at which all the members of the board tendered their resignations. All were accepted except those of the chairman, John A. Topping, and the vice-president and general manager, Frank H. Crockard, who remained on the board temporarily. Of the nine vacancies thus created six were filled by the election of the following representing the United States Steel Corporation: E. H. Gary, W. E. Corey, W. B. Dickson, W. J. Filbert, Richard Trimble and Thomas Murray, respectively chairman, president, vice-president, controller, secretary and assistant secretary of the Steel Corporation.

It is stated that out of about $30,500,000 of full paid capital stock of the Tennessee Company, between $26,000,000 and $27,000,000 had been deposited with J. P. Morgan & Co. up to the end of last week, to be exchanged for United States Steel Corporation second mortgage 5 per cent. bonds. The announcement of the sale of the majority interest to the Steel Corporation was made on November 7 by Chairman Topping to the stockholders of the Tennessee Company in the following notice:

A sale of the majority interest of the capital stock of this company has been consummated with the United States Steel Corporation, the basis of which is that our stockholders agree to accept United States Steel sinking fund second mortgage 5 per cent. bonds at 84 in exchange for their stock at par, which will give you approximately $119 in bonds for $100 of stock. An option is extended to you of selling your interest on this basis, the option expiring November 21, 1907. If you desire to participate you should immediately place your stock in the hands of J. P. Morgan & Co., who have been authorized to carry out the details of the exchange of securities.

It is understood that the first proposal of the sale to the Steel Corporation as a way out of the difficulties involving some New York banks and bank officials was made on Friday, November 1. It should be said that only a minority of the Tennessee Company stock was pledged as collateral, either with the banks whose condition had been causing uneasiness, or elsewhere. The largest holders in the Tennessee Company had their stock paid for and in safe deposit boxes. The question which the situation presented to such members of the Tennessee syndicate was that of allowing so much of their stock to be added to the minority stock as was necessary to enable the minority to transfer a controlling interest to the Steel Corporation. In consenting to the terms proposed such stockholders signified their willingness to make what they considered a sacrifice in the interest of clearing up the financial situation. Later, when the terms offered by the Steel Corporation were somewhat improved from the standpoint of the Tennessee stockholders (having been originally bonds at par for stock at par), the largest holders among the latter concluded to surrender all their holdings on the basis of $119 par value of Steel Corporation bonds for $100 par value of Tennessee Company stock. This put a value of 84 on the bonds.

While on the one hand the earnings of the Tennessee Company in the past two years were not considered as warranting the price that has been put upon the Tennessee Company's stock in the market for some months past, the holders of the stock argued that within the next 60 days the company would have the benefit of the important improvements which are now being completed or have been recently completed at Ensley, adding to the output of steel and working important economies in the cost of production. Moreover, the labor situation, which has been at its worst in the South in the past year, was expected to improve steadily from this time on. An important asset, also, from the standpoint of the Tennessee holders was the total of nearly 400,000 tons of rails which the company has on its order books for delivery in 1908.

A New President Elected.

At a meeting of the new Board of Directors of the Tennessee Company held in New York Tuesday, November 12, John A. Topping resigned as director and as chairman. Gordon C. Crawford was elected a director in his stead and was chosen president of the company. Mr. Crawford has long been prominent in the operating organization of the National Tube Company, being general superintendent at McKeesport, Pa. He is a member of the Blast Furnace Committee of the Steel Corporation and was a member of its Coke Committee which went to Europe some months ago to investigate by-product ovens. He will make his headquarters at Birmingham, Ala.

California Oil in Heavy Demand.

For some weeks there has been talk of a possible oil shortage on the Pacific Coast, and several projects for the development of additional wells have been meeting with favor among California capitalists. Everything points to an increased consumption of oil. A prominent Japanese steamship company has purchased three large tank steamers for the purpose of carrying oil from California to the Orient for the use of steamers and industrial plants. This shows that the Japanese are determined to have their own oil carrying fleets. Japan has made contracts with California oil companies for the delivery of huge quantities of liquid fuel. The Japanese navy department is thoroughly committed to the use of fuel oil in war vessels, which is of great importance. Advices from England say that 22 tank steamers are building at the present time, some of which will be launched before the end of the year, and the entire fleet will be in service early in 1908.

The fact has just become generally known that the reserve supply of oil in the Bakerfield and Santa Maria districts is so far below what it is supposed to be that many of the big storage tanks are empty and the reserve oil supply throughout the State is being diminished more rapidly than all the producing wells can replenish it. Independent producers, who thought that there was an abundant supply for all needs, now realize that a greater quantity of oil is being used than is being produced, and many of them will hold what they have and refuse contracts at present prices. The demand for oil was never greater than at present, and it is greater than the prices would seem to indicate. An increase in the demand for oil well supplies, drilling rigs, oil casings, &c., is to be expected in the near future as a result of the increased activity in the oil regions.

In a decision of the Interstate Commerce Commission, handed down at Washington November 11 by Commissioner Clements, it is ordered that the Great Northern Railway Company pay to the Cambria Steel Company reparation in the sum of $2433.04, excessive and unreasonable charges on a shipment of steel rails to Seattle, Wash. It was held by the commission that the rule or regulation of the defendant company whereby freight charges were collected from the defendant upon a higher minimum loading requirement than the practice of the carriers governed by the Master Car Builders' Association rules would permit, was unreasonable and unjust. This rule having been modified subsequent to the movement of the shipments in question, no order is made in regard thereto, except that as to the reparation which the railroad company is ordered to pay by December 15 next.

The General Electric Company, Schenectady, N. Y., has presented a claim before the Interstate Commerce Commission that it should receive an allowance of about $100,000 annually from the New York Central and Delaware & Hudson railroads for shifting cars from their tracks to various parts of the electric plant. Previous to an indictment of the two roads for rebating, they had made payments to the General Electric at the rate of about $50,000. The case against the New York Central, tried before Judge Ray in Syracuse, resulted in a disagreement as to whether the sums paid constituted a rebate or a proper allowance. The General Electric Company has an elaborate switching system of its own. At times, the Central has as many as 700 cars in the yards of the electric company.

New Publications.

Practical Metal Turning. By Joseph G. Horner. Pages, 404, 5¼ x 8 in. Illustrations, 488. Published by the Norman W. Henley Publishing Company, New York. Price, $3.50.

The author in preparing this handbook for the use of machinists, technical students and amateurs, has aimed to meet the need for a comprehensive treatment of modern lathe work in the large shops. The 28 chapters are grouped under six heads: 1, The Lathe, Its Work and the Tools; 2, Turning Between Centers; 3, Work Supported at One End; 4, Internal Work; 5, Screw Cutting and Turret Work; 6, Miscellaneous Matters—included in this last section being an important chapter on speeds and feeds and tool steels. Mr. Horner's experience has been acquired for the most part in important British shops, and his contributions to the British technical press have been voluminous, particularly as relating to milling machine practice. However, comparison of methods in English and American plants is made in a number of instances in the present work, and the author's familiarity with the best practice in this country is apparent. The principles of the various branches of turning are demonstrated and well illustrated. In the chapter on chucks the usual forms, as well as some unusual ones, are described and illustrated. An important section of the book is devoted to modern turret practice, with numerous examples of turret work. Equally full treatment is given of the subject of boring. Tool holders are illustrated by large numbers of representative types. In the chapter on speeds and feeds, instances are cited of the distrust of the new steels that has accompanied the development of high speed lathes. Lighter drives have been replaced with heavier, though the latter would not have been considered necessary at the outset before the possibilities in deep cuts were realized. The experience of a large firm is cited in support of the view that in the general run of turning shops the greatest economy is got by the use of medium high speeds and rather coarser feeds, as against the advocacy by some engineers of high cutting speeds with light feeds. A firm manufacturing high speed steel is quoted to the effect that the best shape of tool for roughing purposes is formed by bending the end of a bar to 30 degrees from the straight. This firm adds:

> It is in our opinion a mistake to give a tool which will be asked to take a heavy cut, side rake right up to the cutting edge. We have always noticed in the case of a tool having a feed of about 1-16 in. there is practically no abrasion. We have also found a tool with a straight cutting edge and the side rake or lip brought to within a short distance from the cutting edge and then continued flat to the cutting edge to give the best results. The turnings themselves, as soon as the tool is put to work, start to make the top rake right, leaving the portion directly behind the cutting edge alone, and it is not until the tool fails that this goes with the rest. This extra metal at the edge supports and materially increases the life of the cutting edge.

With its thorough-going and competent treatment of modern metal turning Mr. Horner's book deserves well at the hands of machinists, superintendents and all connected with machine shop operations.

The Blacksmith's Guide. By J. F. Sallows. Pages, 157. 4½ x 7 in. Illustrations, 164. Published by the Technical Press, Brattleboro, Vt. Price, cloth bound, $1.50.

The results of the author's 27 years' experience, 14 years of which were as foreman of blacksmith shops connected with manufacturing plants, are embodied in this handbook. It bears evidence of sifting and compression, so that the reader gets the maximum of practical value in small space. There are six chapters with these titles respectively: Machine Forging, Tool Forging, Hardening and Tempering, High-Speed Steel, Casehardening and Coloring, Brazing and General Blacksmithing. In an appendix are given a table of decimal equivalents, reproductions in colors showing the coloring of a hardened wrench, colored heat chart, colored temper chart and working drawings of a casehardening furnace. Mr. Sallows, with proper pride in his work, magnifies the blacksmith's art by this comparison with that of the machinist: "A young man from the farm can go into a machine shop, start in by running a drill press, then a lathe, and by reading and strict attention to business he will soon become a fairly good machinist. It is not so with a blacksmith, and especially a machine blacksmith, who usually has difficulty in acquiring full knowledge of his trade. Blacksmiths in general have but a small chance to learn anything more than they can dig up in their own daily toil." It should be said in this connection that the periodical literature of blacksmithing is now more plentiful and valuable than was the case a few years ago.

The demands of the machine shop upon the forge shop have been growing steadily, and the need of a higher grade of skill in the latter is constantly being emphasized. In presenting in usable shape the results of his experience, and in putting particular stress on the features of approved practice in hardening, tempering and casehardening, the author has done an important service to his trade and to the machine shop as well, much matter being embodied which machinists and tool makers will find valuable.

Mechanical Drawing. By Ervin Kenison, S. B., instructor in mechanical drawing Massachusetts Institute of Technology, Boston, Mass. Size, 6½ x 9¼ in. Pages, 160. Illustrations, 140. Price, $1. Publisher, the American School of Correspondence, Chicago, Ill.

This book is offered as a practical manual of self-instruction in the art of drafting, lettering and reproducing plans and working drawings, and is intended not so much for teachers of drawing as for the home use of students. It is one of a series of books published by the American School of Correspondence for home study and self-instruction. Emphasis is laid on the fact that the book is practical, and not complicated by theories or any more scientific treatment of the subject than a student could be expected to understand without personal attention from an instructor. It would seem to be of special value to the young mechanic who desires to become a draftsman.

Canadian Industrial Notes.

TORONTO, November 9, 1907.—James Conmee, M. P., who was in Toronto recently, states that extensive deposits of bog ore have been discovered on the line of the Grand Trunk Railway Company's Lake Superior branch, whose lake terminus is at Fort William. The deposits are said to be at two points, 80 miles from Fort William in one case and 150 miles in the other. He says that tests show the ore to be high in iron and free from sulphur, phosphorus and titanium.

The steamer Paliki of the Clergue fleet, is taking 2000 tons of pig iron from the Atikokan Iron Company's Port Arthur Furnace to the works of the Lake Superior Corporation at Sault Ste. Marie.

Francis W. Crittall, a steel man from England, is in Toronto inquiring as to the advantages for establishing a Canadian branch of the steel works with which he is connected.

Lachine is to have large works for the building of locomotives, if an agreement entered into with an English syndicate is carried out. The agreement, embodied in a by-law, was submitted to the ratepayers some days ago and received their almost unanimous ratification. The company is to receive from the town a cash bonus of $50,000, exemption from taxation, and water at half the usual rates. On its part, the company will erect a plant at a cost of about $2,250,000, will employ 500 men in the first year, 1000 men the second year, and 1500 men the third.

The Page-Hersey Pipe & Tube Company is putting up a mill at Welland for the manufacture of pipe from 4 to 8 in. in diameter. Contracts for the construction of the plant are now in hand. Raw material is to be supplied from the works of the Ontario Iron & Steel Company, which are adjacent. C. A. C. J.

The National Founders' Association.

The eleventh annual convention of the National Founders' Association began its sessions at the Hotel Astor, New York, Wednesday morning, November 13. The attendance at the opening was about 200, including practically all those who have been prominent in the councils of the association for a number of years. The president, O. P. Briggs, who has exercised the functions of commissioner for the past four years, called the convention to order at 11 o'clock, and after announcing committees read his report for the past year. It called attention to the fact that while last year was the stormiest in the association's history, so far as strikes are concerned, the present year closes with the most peaceful conditions prevailing that have been known in the same period of 11 years. In the past six months but one new strike has occurred, involving a member of the association, and all strikes of an earlier date some time ago arrived at the point where no financial assistance has been necessary. The report reviewed the developments of the year, particularly in the matter of labor legislation, the campaign of education the association is conducting and the progress made in establishing its principles. In the matter of judicial proceedings, the president advised that efforts be made to secure decisions declaring picketing in any form to be illegal; also declaring the "apprentice labor trust" within the scope of the Sherman Anti-Trust law. The assistant commissioner, A. E. McClintock, presented a report dealing particularly with the advance the association has made in the past two years in training specialty molders. Marked progress was reported in introducing molding machines and securing their effective operation.

The secretary, F. W. Hutchings, read the report of the treasurer, the People's State Bank of Detroit, Mich. It showed a very substantial gain in financial strength, the reserve and general funds of the association having been increased in the year.

The secretary's report showed a membership of 433 firms, operating 486 foundries. The average number of men employed in the shops of members in July, August and September this year was 22,925, as against 24,577 in the same months last year. The falling off of 1652 was considered small, in view of the change in business conditions. The report discussed the methods followed in the distribution of literature among employers and employees, chiefly the latter.

The following committees were appointed:

Finance.—W. H. Winslow, Winslow Brothers Company, Chicago; James McNaughton, American Locomotive Works, Schenectady, N. Y.; Geo. W. Watts, Canada Foundry Company, Ltd., Toronto, Ont.

Resolutions.—F. B. Farnsworth, McLagon Foundry Company, New Haven, Conn.; Justus H. Schwacke, Wm. Sellers & Co., Inc., Philadelphia; Geo. C. Forgeot, Allis-Chalmers Company, Milwaukee.

Press.—F. W. Hutchings, Detroit, Mich.

Reports were made on the strikes at Dayton, Ohio, and Detroit by A. C. Marshall and Walter Russell, respectively.

A resolution presented by Edward F. Jones, Binghamton, N. Y., providing for the appointment of a committee to investigate pig iron and copper market conditions for the first two quarters of 1908 and report to the convention as to probable prices, was referred to the Resolutions Committee.

Arrangements were made for a banquet on Wednesday evening, to be addressed by Senator Spooner of Wisconsin and Hon. Geo. W. Ross of Toronto.

A. C. Dinkey, president of the Carnegie Steel Company, Pittsburgh, has been granted letters patent on an insulated metal tie. A number of the improved ties are being tested with a view to determine what is needed further in insulation. Mr. Dinkey says: "The outlook for the ties is good. We are endeavoring to perfect something that will be fully adapted for service when timber becomes so scarce that timber ties will be prohibitive."

The Aging of Mild Steel.

A paper on the above subject was read at the May meeting of the Iron and Steel Institute by C. E. Stromeyer, Manchester, England. It was abstracted in *The Iron Age* of June 20. At the recent meeting in Vienna, Mr. Stromeyer followed this up by a paper describing further experiments. In this newer work he has had the assistance of Professor Hatt of the Purdue University, Lafayette, Ind., who made drop tests, or rather impact tension tests, on specimens from the plates. It is a combination of a shock and tensile test. The plates have also been examined by the Brinell hardness testing machine and many micro-photographs illustrate the paper.

Special attention was given to the influence of cold, and samples were tested, while still cold, that had been stored for 23 weeks in ice. Nearly all of them gave silky fractures, as contrasted with crystalline fractures from the same steels that had been steamed. As these experiments have been carried out on a heterogeneous lot of steels, some being from failed boilers and others known to contain excessive amounts of silicon, phosphorus, or sulphur, they go far toward dispelling the not uncommon belief that prolonged and intense cold may cause some steels to become brittle. This, it must be remembered, applies to mild steels.

The results of Professor Hatt's impact tension test do not seem to stand in any relation to the aging properties, as revealed by the nicked bend tests, to the chemical compositions, or to the behavior in practice. It is possible that, when the additional tests which are now on hand are completed, some correlation may be established.

The author's general deductions are that bending tests of samples with sheared edges seem to be of no scientific value, even if the curvatures near the fractures are carefully measured, for although the samples examined embrace most diverse qualities of mild steel, this bending test has revealed nothing definite about them. Bending tests of samples with planed edges are even less useful.

Bending tests of samples having planed and nicked edges seem to be the best test yet devised for studying aging qualities. The injury done to the various plates by nicking, which is revealed by bending, does not appear to discriminate between plates which have high or low percentages of phosphorus, sulphur, &c., nor between those which have and those which have not behaved well in practice. In this respect, therefore, the bending of nicked samples is no better than the ordinary tensile, temper and cold bending test.

The brittleness revealed by the bending of nicked samples, especially if the plates are maintained at a fairly high temperature, as in boilers, suggests that calking which grooves the underlying plates may start a local brittleness, which after a time might endanger the boiler, if severely stressed.

The author's experiments as far as they have gone have not yet revealed a test which will discriminate between reliable and treacherous qualities of steel. They have nevertheless, established the fact that mild steel does possess aging properties, and that certain practices which are still fairly common among engineers are not free from dangerous possibilities. G. B. W.

The Museum of Safety Devices Awarded a Grand Prize.—The international jury in the section of social economy at the International Book, Paper and Publicity Exposition, which closed in Paris last month, made an award of the Grand Prix to the American Museum of Safety Devices and Industrial Hygiene. A Diploma of Honor, the second highest award, was made to Charles Kirckhoff and T. C. Martin, respectively chairman and vice-chairman of the Museum's Advisory Council; also to Dr. L. L. Seaman and Rudolph Lenz, for their active interest in promoting the work of the Museum. The Museum is now occupying the entire fifth floor at 231-241 West Thirty-ninth street, New York City, and all inquiries for space, exhibits and other information should be sent to Dr. W. H. Tolman, director.

Many Furnaces Go Out

Pig Iron Capacity Cut Down 48,000 Tons a Week.

The sharp reduction of pig iron output in the past two weeks is the dominating feature of the blast furnace situation. It quite takes precedence of the fact that a record output was made in October. Indeed, it appears from the fact that so many furnaces were blown out in the closing days of October and on the first day of November, that but for the desire to make a new record before the inevitable curtailment the blowing out movement would have begun earlier. In the past few days *The Iron Age* has communicated directly with the blast furnace companies to ascertain what furnaces have blown out since the opening of the month. The detailed list is given below. The United States Steel Corporation now has 30 of its 97 effective Northern furnaces out of blast. The Republic Iron & Steel Company has four of its six Northern furnaces out and two of its three Thomas furnaces in Alabama. The Lackawanna Steel Company put out in October its five furnaces in the Lebanon Valley and two of its seven Buffalo stacks. The other steel companies have not participated in the movement as yet to the same extent. The Cambria Steel Company and the Pennsylvania Steel Company each have one furnace out. The former company will blow out another, probably about December 1.

The net result of the curtailment in October and on the first day of November was a reduction of 30 in the number of active furnaces. Since November 1, 21 furnaces have gone out and no resumptions are reported. In addition, four furnaces are definitely reported as to be blown out by December 1. The statistics of the movement is thus as follows to date:

	Gross tons.
Weekly capacity October 1	511,397
Weekly capacity November 1	491,436
Reduction in weekly capacity since November 1, about.	28,000
Reduction in weekly capacity since October 1, about..	48,000
Present weekly capacity active, about	463,000

The production of coke and anthracite iron was 2,336,972 tons in October, as against 2,183,487 tons in September, or 75,386 tons a day, as compared with 72,783 tons a day in the preceding month. The table below gives the production of coke and anthracite furnaces in October and the four months preceding:

Monthly Pig Iron Production—Gross Tons.

	June. (30 days)	July. (31 days)	August. (31 days)	Sept. (30 days)	Oct. (31 days)
New York	141,044	155,658	150,385	150,264	152,710
New Jersey	32,360	34,633	35,026	32,877	30,574
Lehigh Valley	66,097	61,854	60,160	68,559	71,936
Schuylkill Val.	57,184	60,035	59,807	53,978	48,543
Lower Susquehanna and Lebanon Val.	67,916	61,279	64,456	59,580	67,286
Pittsburgh Dis.	544,247	534,668	525,341	509,497	533,078
Shenango Val.	157,975	167,319	152,917	144,978	158,315
West. Penn.	133,935	129,887	129,922	133,906	143,078
Md., Va., and Kentucky	89,028	86,496	84,462	81,398	86,829
Wheeling Dis.	105,479	108,659	121,078	117,445	134,445
Mahoning Val.	178,731	172,704	177,438	162,644	180,968
Central and North. Ohio.	169,830	179,987	176,700	164,314	185,422
Hocking Valley and Hanging Rock	35,365	34,050	35,590	32,138	33,843
Mich.,Minn.,Mo., Wis., Colo.	76,962	76,902	77,961	79,112	81,155
Chicago Dis.	222,996	216,915	215,641	212,413	244,645
Alabama	132,630	136,936	144,374	142,766	146,354
Tennessee, Georgia and Texas	35,121	37,678	39,152	37,618	37,791
Totals	2,246,900	2,255,660	2,250,410	2,183,487	2,336,972

Production of Steel Companies.—Returns from all the plants of the United States Steel Corporation, the Cambria, Pennsylvania, Maryland, Lackawanna, Wheeling, Republic, Jones & Laughlin, La Belle, Bethlehem, Calumet, Inland and Colorado companies show the following totals of products month by month. We give separately a statement of the output of spiegeleisen and ferromanganese, which is included for each month in the total production:

Production of Steel Companies.—Gross Tons.

	Pig.—Total production. 1905.	1906.	1907.	Spiegeleisen and ferromanganese. 1906.	1907.
January	1,129,042	1,358,015	1,406,397	26,305	21,477
February	1,027,937	1,226,760	1,317,923	26,988	19,444
March	1,232,255	1,400,395	1,424,827	23,595	31,091
April	1,222,710	1,333,591	1,446,788	28,054	26,527
May	1,287,438	1,372,423	1,470,080	29,447	28,822
June	1,149,404	1,293,437	1,457,230	22,737	30,942
July	1,114,409	1,323,391	1,452,557	20,153	25,343
August	1,186,050	1,237,485	1,445,685	18,327	23,696
September	1,262,033	1,264,380	1,417,153	24,078	30,270
October	1,370,960	1,452,200	1,479,416	23,517	22,501
November	1,334,644	1,411,350	.....	29,119	.....
December	1,356,962	1,445,528	.....	21,707	.....

The table below gives the weekly capacity of coke and anthracite furnaces in blast November 1 and October 1:

Coke and Anthracite Furnaces in Blast.

Location of furnaces.	Total number of stacks.	November 1. Number in blast.	November 1. Capacity per week.	October 1. Number in blast.	October 1. Capacity per week.
New York:					
Buffalo	14	12	26,642	14	30,019
Other New York	10	5	5,817	5	5,042
New Jersey	8	6	6,785	7	7,731
Spiegel	2	0	0	1	373
Pennsylvania:					
Lehigh Valley	25	19	15,078	20	15,091
Spiegel	3	3	1,013	2	906
Schuylkill Valley	14	10	10,241	12	12,595
Spiegel	1	1	410	1	817
Low. Susquehanna.	8	5	6,064	6	7,158
Spiegel	1	1	676	1	802
Lebanon Valley	8	5	4,274	8	6,324
Spiegel	2	0	0	2	817
Pittsburgh Dist.	45	38	109,249	41	113,512
Spiegel	3	3	2,850	3	2,591
Shenango Valley	20	18	34,749	19	36,007
West. Penn.	27	22	30,726	23	30,977
Maryland	4	4	7,987	4	7,924
Wheeling Dist.	14	10	22,582	14	27,404
Ohio:					
Mahoning Valley	18	16	35,911	17	39,042
Central and Northern and Michigan.	22	17	39,923	20	40,830
Hocking Valley and Hanging Rock	12	11	7,644	11	7,497
Illinois and Indiana.	23	23	53,896	22	48,014
Spiegel	2	2	1,701	2	1,548
Minnesota	1	1	1,176	1	1,264
Wisconsin	6	5	4,275	6	5,447
Missouri	1	1	574	1	581
Colorado	5	4	8,967	5	8,825
Spiegel	1	1	266	0	0
The South:					
Virginia	23	14	8,435	15	9,153
Kentucky	7	4	2,775	4	2,392
Alabama	46	27	32,427	30	32,213
Tennessee	18	14	8,029	14	7,956
Georgia and Texas.	3	1	294	2	745
Totals	397	303	491,436	333	511,397

The Curtailment Movement.

The merchant furnaces have not participated in the shutting down to the same extent as the steel companies, but there are indications that December will accent the curtailment. Reckoning that production for some months has been at the rate of 27,000,000 tons a year, apart from the spurt in October, and that charcoal iron has been produced at a rate of 400,000 tons a year, we would have a coke iron production on the basis of 26,600,000 tons a year. The reduction in capacity since October 1, about 48,000 tons a week, represents 2,496,000 tons a year. Thus the stir about blowing out has resulted thus far in cutting down production less than 10 per cent. The numerical showing, a net reduction of 51 furnaces since October 1, would indicate a more drastic movement, but as is always the case the furnaces of smaller capacity are put out first.

Among furnaces blown out in October or on November 1 were two Lackawanna at Buffalo, one Wharton and one New Jersey Zinc in New Jersey, one Henry Clay and one Swede in the Schuylkill Valley, one Thomas in the Lehigh Valley, two Edgar Thomson, one Clairton and one Donora in the Pittsburgh District, one South Sharon and one Shenango in the Shenango Valley, one Cambria in western Pennsylvania, one Steelton in the Lower Susquehanna Valley, two Bird Coleman, two Colebrook and one North Cornwall in the Lebanon Valley, one Crozer and

Max Meadows in Virginia, both Bellaire, one Mingo and Steubenville in the Wheeling District, Newburgh, Franklin and Steelton in northern and central Ohio, one Mayville in Wisconsin, Niles and one Ohio in the Mahoning Valley, one Sloss, one Oxmoor and Williamson in Alabama and San Lanham in Texas. Comparatively few furnaces were blown in last month, the list including Lehigh Zinc in the Lehigh Valley, the new No. 4 Monongahela in the Pittsburgh District, Alice in the Shenango Valley, Alleghany in Virginia, No. 2 South Works in the Chicago District, one Hubbard in the Mahoning Valley and No. 2 Etowah in Alabama.

The list of furnaces blown out since November 1 includes Allentown rolling mill in the Lehigh Valley, Paxton No. 1 at Harrisburgh, Stewart, Hall and Atlantic in the Shenango Valley, Warwick No. 1 in the Schuylkill Valley, one Edgar Thomson, two Lucy and one Isabella in the Pittsburgh District, Zanesville in Ohio, Hannah and No. 1 Hazelton in the Mahoning Valley, two North Works, two Union Works and two Milwaukee of the Illinois Steel Company, No. 1 Pioneer at Thomas and Etowah No. 2 in Alabama. In addition, Marshall in western Pennsylvania, Franklin in New York, Thomas at Milwaukee, Wharton No. 2 in New Jersey, one Thomas in the Lehigh Valley and Keystone at Reading, Pa., are definitely appointed for blowing out this month. These six furnaces have a combined capacity of about 5500 tons a week.

The active weekly capacity in coke and anthracite iron has shown the following fluctuations since January 1, 1903:

	Capacity per week.		Capacity per week.
November 1	491,436	May 1	452,031
October 1	511,397	April 1	439,564
September 1	507,768	March 1	403,157
August 1	513,471	February 1	405,792
July 1	528,170	January 1, 1905	377,879
June 1	523,220	December 1, 1904	357,846
May 1	524,538	November 1	334,249
April 1	496,456	October 1	319,249
March 1	511,035	September 1	291,573
February 1	492,359	August 1	246,092
January 1, 1907	507,397	July 1	272,301
December 1, 1906	513,860	June 1	336,107
November 1	500,580	May 1	368,244
October 1	469,665	April 1	337,257
September 1	441,426	March 1	308,751
August 1	449,908	February 1	273,692
July 1	460,570	January 1, 1904	185,636
June 1	472,622	December 1, 1903	244,156
May 1	484,031	November 1	273,715
April 1	484,240	October 1	353,142
March 1	479,737	September 1	360,197
February 1	482,156	August 1	353,681
January 1, 1906	463,673	July 1	384,825
December 1, 1905	475,814	June 1	388,178
November 1	460,449	May 1	373,496
October 1	445,468	April 1	386,215
September 1	412,563	March 1	347,424
August 1	410,088	February 1	335,239
July 1	408,617	January 1, 1903	346,073
June 1	443,092		

National Metal Trades Association.—President M. H. Barker, Boston, and Commissioner Robert Wuest, Cincinnati, the committee appointed on time and place of the next convention, have decided on March 25 and 26, 1908, at the Hotel Astor, New York.

The Collector of Customs at Buffalo, N. Y., has been instructed to allow on the exportation of steel rails, billets, blooms, slabs, bars and structural material, including plates, channels, beams, angles, tees and other structural forms manufactured by the Lackawanna Steel Company, with the use of imported pig iron, a drawback equal to the duty paid on the imported pig iron less the legal deduction of 1 per cent.

The Mexican Government has made official announcement that the iron mines in Lower California, which were purchased about three years ago by the Pacific Steel Company, promoted by a number of Americans, have been taken charge of by the Federal authorities, because the company failed to pay the taxes on the properties. The mines will be sold at auction by the Government December 1.

PERSONAL

The Sheldon Axle Company, Wilkes-Barre, Pa., has re-elected Edwin H. Jones president. William H. Son, who has been general manager of the spring department for several years, was elected vice-president and general manager; J. Fred Armstrong, secretary, and Chester A. Ide treasurer. It is said that fully 60 per cent. of all the automobiles manufactured in this country are equipped with Sheldon springs.

S. T. De La Mater, formerly with the Standard Construction Company, Chicago, is now on the staff of the General Fireproofing Company, Youngstown, Ohio, in the engineering department.

H. L. Hibbard, electrical expert to the Bureau of Construction and Repair, United States Navy Department, has resigned that position to enter the employ of the Cutler-Hammer Mfg. Company, Milwaukee, Wis., maker of electric controlling devices. His thorough knowledge of Navy Department requirements and methods will undoubtedly be of great value in the further extension of the Cutler-Hammer line of electric controlling panels for navy yard and shipboard use.

H. T. Kehew, auditor of the Crucible Steel Company of America, has resigned to accept the position of secretary and treasurer of the Pittsburgh Automatic Vise & Tool Company, temporarily held by F D. Blackiston, resigned. He has made a specialty of cost systems and finance in general.

Charles H. Becker, secretary of the American Chamber of Commerce, Paris, France, has accepted the position of assistant to the president of the National Association of Manufacturers of the United States. He will take up his new duties December 1.

S. T. Callaway, who has long been identified with the company, has been elected secretary of the American Locomotive Company, this having been made a separate position. He is a son of the late S. R. Callaway, former president of the company.

W. Edgar Reed, electrical engineer, formerly with the Westinghouse Electric & Mfg. Company in Paris and later at East Pittsburgh, has opened an office in the Machesney Building, Pittsburgh, as general consulting engineer for electrical work.

Andrew Schiefer, for several years superintendent of the Massillon Iron & Steel Company, Massillion, Ohio, has taken the position of superintendent at the Dimmick pipe plant, Birmingham, Ala.

E. G. Herndon of the Dodge Coal Storage Company, Philadelphia, Pa., has been appointed resident engineer at Chicago.

Harry A. Phillips, who for a number of years has been connected with the Boulter Mfg. Company, Inc., Philadelphia, Pa., manufacturer of fire brick specialties, as president and general manager, has resigned and accepted the position of sales manager for the Baltimore Retort & Fire Brick Company, Baltimore, Md.

The decoration of the Legion of Honor has been bestowed upon Col. Carroll D. Wright, former U. S. Commissioner of Labor. The insignia was presented to him by M. Bonzom, acting French Consul-General, at a dinner given at the Engineers' Club, New York, to the Advisory Council of the American Museum of Safety Devices and Industrial Hygiene, Dr. Josiah Strong presiding.

At Youngstown, Ohio, objections have been filed by the United States Steel Corporation, the Republic Iron & Steel Company and the Youngstown Sheet & Tube Company to the paying of charges for car service as directed by the Ohio Railroad Commission. Before the State rules became effective, the blast furnaces at Youngstown operated under the Pennsylvania rules which relieved them of car service charges. The commission will be asked to make a ruling similar to that regarding coal cars at lake ports, the conditions, it is alleged, being similar. The commission has also been asked to establish a seventh grade of freight to include such commodities as coal, pig iron, lumber, stone, grain, &c.

NEWS OF THE WORKS.

Iron and Steel.

Marshall Furnace, at Newport, Pa., will be blown out November 18. During the suspension repairs and improvements will be made.

No. 1 Paxton furnace, at Harrisburg, Pa., operated by the Central Iron & Steel Company, has been blown out. It will be repaired.

It is stated that No. 3 furnace of the E. & G. Brooke Iron Company, at Birdsboro, Pa., will be started as soon as repairs are completed.

The puddle and skelp mills of the Susquehanna Iron Company at York, Pa., have resumed operations. Repairs and improvements were made.

Kidd Brothers & Burgher Steel Wire Company, Aliquippa, Pa., manufacturer of polished drill rods and annealed special tool steel, &c., has recently completed a new brick building, 35 x 45 ft., to serve as a power house and machine shop. The machine shop was formerly located in its main building, but this space has been utilized for an extension to the wire drawing department, which will increase its capacity about 20 per cent. The company reports that its different departments are busy, none of its orders having been canceled, and the outlook for the future is very satisfactory.

A. M. Byers & Co., manufacturers of iron pipe, Pittsburgh, Pa., have recently bought some more ground adjacent to their plant, giving them control of the entire square. No additions to equipment are contemplated at the present time.

The entire puddling plant of the Youngstown Sheet & Tube Company at Youngstown, Ohio, containing about 50 furnaces, has shut down. The tube and sheet mills are working in steel exclusively.

The Eleanor Iron Company, Hollidaysburg, Pa., has closed down its rolling mills until the conditions in the iron trade become better.

The blooming mill of the Alan Wood Iron & Steel Company, Conshohocken, Pa., which has been shut down for repairs for several weeks, was again put in operation this week and will continue running as long as sufficient business is in hand to warrant its operation.

The Pencoyd Iron Works of the American Bridge Company, beginning with November 11, started operating its plant on five days a week. This reduction is due to the lack of sufficient orders to keep the plant running full, and unless business improves it is said that further curtailments will be made.

General Machinery.

The Larsen-Baker Ice Machine Company, Omaha, Neb., has appointed the N. C. Davison Company, Empire Building, Pittsburgh, its selling agent for Ohio, West Virginia and Western Pennsylvania.

The D. L. Baker Machine Company, Alfred, N. Y., manufacturer of the Baker improved planter, is arranging to erect a new machine shop which will be equipped with modern machinery.

The Humboldt Machine Works, Humboldt, Tenn., has just been acquired by a stock company composed of H. Baumgertner, H. A. Watson of Trenton, Tenn., and W. M. Bunton of Jackson, Tenn. The machine shops will be increased at once and the territory enlarged. It is intended to do a manufacturing business in addition to the regular machine work. The manufacture of gasoline engines and boilers will be promptly taken up.

The Ferracute Machine Company, Bridgeton, N. J., manufacturer of presses and dies for sheet metal work, made shipment of its presses last week to India, Austria, France and England, besides several carloads of large presses to manufacturers of electrical goods in this country. The company's new shops are provided with electric cranes and the most approved modern machinery, placing them in a position to handle large orders.

The Exeter Machine Works, Pittston, Pa., manufacturer of elevating and conveying machinery, &c., intends building an addition to its shops for the manufacture of J. Stone & Co.'s manganese bronze ash expellers and other marine appliances, which are well known in Europe. The new building will be about 60 x 84 ft., of brick construction, and will be equipped with modern appliances.

Power Plant Equipment.

The Board of Water Commissioners, Atlanta, Ga., will receive bids until November 25 for one 20,000,000-gal. vertical triple expansion high duty pumping engine of self-contained type.

The Dutchess Light, Heat & Power Company, Rhinebeck, N. Y., has been granted permission by the Public Service Commission to extend its lines to Red Hook and Hyde Park and to issue $20,000 of additional stock, the proceeds to be devoted to the acquisition of land and to the extension of its plant. Plans for the improvements have not been worked out. R. Raymond Rikert is manager.

The Torr Electric Company has been incorporated at Farmersburg, Ind., with $20,000 capital stock, by E. W. Jennings, president; W. S. Baldridge, treasurer; A. D. Torr, secretary and general manager. The company succeeds A. D. Torr, and its plant furnishes light and power to Farmersburg and Shelburn, six miles distant. It will install additional machinery next spring.

The Bridgewater Mfg. Company, Bridgewater, Va., is to build a hydraulic plant to furnish 500 hp. additional. It is probable that additional water wheels and electric light equipment will be purchased in the spring. C. P. E. Burgwyn, Richmond, Va., is the engineer.

The report of the business done by the Westinghouse Machine Company, Pittsburgh, during the first six months of the current fiscal year ending October 1, shows the company's sales were several hundred thousand dollars ahead of those during the same period of last year. The steam turbine department shows an advance over last year of 10 per cent., and the stoker business was 16 per cent. greater, while the steam engine and gas engine departments held their own. Several very good orders for turbine equipments have recently been booked, among them being one for the city of Alameda, Cal., to be installed in the power house of the municipal lighting plant; another for the Oneida Knitting Mill Company, Oneida, N. Y.; a third for a silk mill; a fourth for the city of Wyandotte, Mich., and an order for two 500-hp. turbo-generators for the Imperial Steel Works of Japan.

Foundries.

A new 54 Newton cupola has recently been installed in the foundry plant of the Peninsular Motor Company, Grand Rapids, Mich., and a No. 66 of similar make has been supplied to the Modern Iron Works, Quincy, Ill., both of which were furnished by the Northern Engineering Works, Detroit, Mich.

The London Machine Tool Company, Hamilton, Canada, is erecting a new foundry, 68 x 144 ft., of brick and steel construction, to be completely equipped with electric traveling cranes and other modern machinery. Contracts for the crane equipment have been placed.

The South Park Mfg. Company, Port Huron, Mich., recently organized, has succeeded the Lee Mfg. Company in the manufacture of automobile parts, pneumatic hoists, injectors and ejectors, valves and brass and aluminum castings.

Bridges and Buildings.

The Northern Construction Company, Milwaukee, Wis., has been awarded the contract for the erection of the new auditorium in that city at the stipulated amount of $449,000. The contract calls for the completion of the building by November 8, 1908. The building will be erected of stone, brick and iron.

Plans are being made for a new bridge over the Wabash River in Tippecanoe County, Ind.; estimated cost, $50,000. John P. Forseman, Lafayette, Ind., is County Auditor.

The Nashville Bridge Company, Nashville, Tenn., will have to alter its plans to some extent on account of the approaches to the Sparkman street bridge over the Cumberland River. The company also expects to erect another large workshop the size of the one just completed. Contracts for work all over the South have been coming in nicely this fall, the management reports, and the work on hand from the South alone would necessitate greatly increasing the plant.

Fires.

The J. L. Meams Machinery Company, Shreveport, La., suffered a $20,000 loss on stock by fire November 1.

The packing plant of Swift & Co., at Harrisburg, Pa., was burned November 11, the loss being about $150,000.

A $2,000,000 fire at Superior, Wis., November 9, destroyed the Great Northern elevator A and power house, Grand Republic mill, Freeman mill and elevator, Minkota mill and elevator, and badly damaged a number of other buildings.

The plant of the Swift Packing Company, Omaha, Neb., was damaged $100,000 by fire November 7.

The plant of the Cornplanter Refining Company, Warren, Pa., was damaged $50,000 by fire November 6.

Hardware.

The Bruner Steel Wagon Company, Wapakoneta, Ohio, has increased its capital stock from $50,000 to $100,000. This action has been taken in view of the material increase in the company's business. The company manufactures all steel farm, truck and log wagons.

The Lefever Arms Company has just placed a contract for the erection of a large brick addition to its factory at Syracuse, N. Y. The company is also about to install several new machines in the present plant. The demand for Lefever guns has been rapidly increasing for some time. The output is marketed altogether through the regular channels of the jobbers and retailers of hardware and sporting goods, and the company does not permit its guns to be advertised or sold by catalogue houses.

The Nimmo Fence & Wire Works Company, Cincinnati, Ohio, has made extensive improvements in its equipment and has greatly improved its facilities for a large output of Norwood products, which include fencing, ornamental and farm gates, settees, tree guards, &c.

The Conneaut Shovel Company, Conneaut, Ohio, has recently installed a new toggle press, which will increase the capacity of its plant 25 per cent. Plans are also under consideration for

a handle factory at the present plant. The company states that it is getting out a new line of cutting spades, such as used by brick companies for cutting clay.

The business of the late Charles J. Root, Bristol, Conn., manufacturer of registering counters, measuring counters and hinges, has been purchased by a new corporation known as the C. J. Root Company, which has an authorized capital stock of $50,000. The incorporators are John T. Chidsey, William E. Sessions and Epaphroditus Peck. C. F. Barnes is the president and John T. Chidsey is secretary, treasurer and manager, and the directors are W. H. Bacon, M. D. Edgerton, F. N. Manross and Mr. Chidsey. Mr. Chidsey has been with the Sessions Foundry Company since 1885 and for the last few years has been purchasing agent and head accountant. The business of the C. J. Root Company is an old one, having been established by the late Joel H. Root in 1867, and after his death conducted by his son, Charles J. Root, until the fatal automobile accident last summer. The lines manufactured include brass and iron registering counters, known as the Elm City, Bristol and Root; measuring counters, brass hinges, including a continuous hinge for pianos, for which there is a large demand, and miscellaneous metal goods. The purchase of the business includes the real estate at what is known as the Island.

S. Cheney & Son, Manlius, N. Y., gray iron founders and manufacturers of hardware specialties, have during the past year made a number of improvements in their plant. These include air compressors, increased steam heat, air hoisters and other apparatus by which the cost of production has been diminished.

The Sturges & Burn Mfg. Company, Chicago, Ill., has added 10,000 sq. ft. of floor space to its plant, thus increasing the company's pressroom facilities, and by which it is hoped to overcome the difficulty experienced the past season in keeping up with orders.

The A. A. Wood & Sons Company, Atlanta, Ga., manufacturer of tools and machinery, has just taken possession of its new building at the corner of Magnolia and Haynes streets. The building fronts 137 ft. on Haynes street, having an average width of about 70 ft.

The Indiana Bank Furniture & Mfg. Company, Indianapolis, Ind., has succeeded the Indiana Screen & Mfg. Company.

The Knox Metal Wheel Company has been incorporated at Knox, Ind., with $30,000 capital stock, by J. W. Murray, president; W. A. Pierson, secretary-treasurer; J. W. Long, vice-president; Edgar W. Shilling, Gus Reiss, Peter Van Derweele and Chas. Windisch. The company at present will manufacture metal wheels and hubs for children's vehicles and later may make the finished article. Most of the heavy machinery has been installed.

Miscellaneous.

The Carnegie Steel Company has made plans for a coke screening plant to be built at the South Sharon furnaces, South Sharon, Pa. This will be in the nature of an experiment, and if successful similar screening plants will be erected at its other blast furnaces.

The Paris Lamp Mfg. Company, St. Louis, Mo., manufacturer of gas fixtures, arc lamps, gasoline lamps and lights, has been incorporated with a capital of $25,000, the incorporators being Richard A. Horst, Richard W. Ziernlein and Julius C. Goebel.

The Wolf Automobile Company has been incorporated at Muncie, Ind., with $10,000 capital stock, to deal in automobiles and accessories and to do repair work. H. H. Wolf, O. F. Raymond and R. W. Williams are the directors.

James Dunlop Smith, president of the De Forest Wireless Company, New York, was in New Castle, Pa., recently, looking for a site to engage in the manufacture of wireless telephones under the De Forest patents. The De Forest Wireless Telephone Company, which is controlled by De Forest and others, has disposed of considerable stock in New Castle.

Plans have been completed by the Pittsburgh-Buffalo Company, Pittsburgh, for the development of 14,000 acres of coal land in Washington County, Pa., and work has already commenced. The company proposes to spend $3,000,000 in this project. Two large shafts will be sunk and every facility for rapid mining will be installed. Electricity will be the power used. The land adjoins the tract owned by the Jones & Laughlin Steel Company.

The Southern Ship Building Company, Jacksonville, Fla., which recently purchased 17 acres of land at Tottenville, S. I., with 700 ft. of water front, intends to move its present plant to the new location, where it will have enlarged facilities for the building and repairing of wooden ships. The company has a complete equipment of tools, machinery, &c., and expects to start operations as soon as the machinery can be placed. The Philadelphia office is located in the Mariner and Merchant Building.

The MacKinnon Boiler & Machine Company, Bay City, Mich., is installing additional machinery in its boiler works, consisting of Kling rotary splitting shears, capacity ¾-in. plate; Lennox bevel shears, capacity ¾-in. plate; Whiting punch, 48-in. throat, and a high speed cold saw, with a capacity of cutting a 15-in. 42-lb. beam in 28 seconds.

The Lehigh Valley Motor Car Company, Allentown, has asked for a Pennsylvania charter. It will be composed of J. M. Mack and others interested in the Mack motor vehicle business.

The Boulter Mfg. Company, Inc., Philadelphia, Pa., which succeeded the business of C. J. Boulter, established in 1835, in the manufacture of special firebrick shapes for assayers and metallurgists and high temperature resisting firebrick, carried on since the above date at 1617-1627 North street, removed recently to 234 North Twenty-third street, where the manufacture of the same grade of materials will be conducted on a much larger scale.

The Hazard, Coates & Bennett Company, dealer in scrap iron and steel, Rochester, N. Y., has purchased several acres of land in South Buffalo, near the Lackawanna Steel Company's plant, upon which it will establish a plant for the storage and handling of scrap metals, with a capacity of 75,000 tons, equipped with improved machinery for hoisting, breaking and loading. A contract has been let to the Lathrop, Shea & Henwood Company for the construction of the necessary buildings and the installation of track scales, traveling cranes, &c. The tract adjoins the new plant of the Buffalo Brake Beam Company and has switching connections with the South Buffalo and Pennsylvania railroads. It is conveniently located as regards all the furnaces in the Buffalo district.

B. F. Johnston, Lewis Block, Pittsburgh, representing the Columbia Fire Brick Company, Canton, Ohio, and the Hayes Run Fire Brick Company, Orvis, Pa., has recently sold 320,000 Columbia brick and 323,000 of the Hayes Run output. The largest order was for new work at Welland, Ont., where 180,000 Hayes Run, 125,000 Columbia and 100,000 wire cut brick were shipped. Orders for wire cut brick in the past month aggregated 140,000.

The International Paper Company contemplates the erection of a hydraulic plant about two miles south of Spier Falls, N. Y., to furnish power for the large pulp mill which the company intends to erect. No definite plans have been prepared, and it will probably be some time before the company erects the plant. Warren Curtiss, Jr., Palmer, N. Y., is superintendent of construction.

The Century Brass Mfg. Company, Cattaraugus, N. Y., which was recently incorporated, is an old company with a new name, new capital, new machinery and a more modern plant. The company manufactures brass goods and plumbers' supplies, and the plant is arranged on the principle of a continuous mill, the first unit being the brass foundry, which is equipped with seven furnaces, molding machines, &c., operated by compressed air, and adjoining the foundry is the core room. From the foundry the castings go to the machine shop, which is equipped with 17 Warner & Swazey automatic turret lathes, and from there they are conveyed directly to the finishing room, where they are ground, polished, &c. From the finishing room they are moved to the nickel plating room, where they are electroplated, and then pass to the assembling room, where they are assembled and tested, both under hydraulic and aerostatic pressure. The product hereafter will be known exclusicely under the name of Century.

October Commercial Failures.

Commercial failures in the United States for October, according to statistics compiled by R. G. Dun & Co., show a large increase over the corresponding month last year. They were, in fact, larger than in any other October for 11 years. The total of defaulted indebtedness involved in the 1139 failures reported amounted to $27,414,990, which compares with 838 failures and indebtedness of $10,553,714 reported in October, 1906. Manufacturing insolvencies involved $12,766,068, or more than $2,000,000 over the total of insolvencies during the same month in 1906. Liabilities of trading failures did not increase as heavily as of manufacturers.

It is still much too early to obtain the liabilities of many banks that were forced to suspend temporarily, the figures thus far reported being 31 in number, but any statement of the amount involved would be a mere guess. There were four similar failures last year involving $3,665,000. It should also be noted that the Westinghouse Company is not included with the October failures because of the peculiar conditions surrounding the temporary receivership. Even with the figures omitted, however, the commercial liabilities last month were larger than in any month since September, 1896.

A meeting of the Administrative Council of the National Metal Trades Association has been called for December 4 to consider the proposed changes in the constitution and by-laws of the organization. The conference will be held in New York City and probably at the Astor House.

The Iron and Metal Trades

Plunging from a record production in October to the first stages of what promises to be a very sharp reduction within two weeks is the extraordinary experience of the Iron trade. During October our Coke and Anthracite furnaces produced the largest tonnage in the history of the country, 2,336,972 tons. Before the month was out 30 blast furnaces had been blown out, and the capacity had declined from 511,397 tons per week on October 1 to 491,436 tons per week on November 1. Special inquiries made by *The Iron Age* during the past few days show that since the first of the month 21 blast furnaces have blown out, whose weekly capacity is estimated at 28,000 tons per week. Six others, with a capacity of 5500 tons per week, are preparing to stop. Therefore, from October 1 to the end of this week the rate of production has been cut down 53,500 tons per week, or a little over 10 per cent. While this is a good beginning, it is quite evident that it is not enough, and that a very considerable additional restriction will be necessary.

Estimates of the lessened requirements of the country, temporarily, vary within pretty wide limits. A restriction of 30 per cent. is regarded as conservative by many, while very high authorities hold that by the middle of January we will not need to run more than one-half the capacity of our Iron and Steel plants.

At the present time the financial situation dominates the trade absolutely. It has not alone led to an almost universal suspension of new business, but has stopped work on contracts on hand and in many instances on the delivery of goods produced. Sellers recognize that it is practically useless to force sales, and the number of lots of material which are being pushed on the market is surprisingly small. There is weakness at many points along the line, as is only natural, but it is evident that the trade will settle down to an orderly readjustment of prices when the proper time comes. In a number of finished lines this will probably come with the opening of the new year. In the meantime, the situation is expected to be sufficiently clear from a financial point of view to permit of formulating effective plans.

The action already taken by the large interests is proof of the fact that production will be adjusted to the consumptive requirements, whatever they may be.

In the metal trade the flurry in Copper is apparently over. It has been shown that prevailing conditions do not justify any pyrotechnics, and that the sounder course of allowing time to cure the severe blows under which the industry has staggered is the safest. November was the record month for Copper exports, the total being estimated at 29,150 gross tons. Electrolytic Copper has sold on the basis of 13.25c. for export. Tin dipped under 30c., but has recovered a little.

A Comparison of Prices.

Advances Over the Previous Month in Heavy Type. Declines in Italics.

At date, one week, one month and one year previous.

	Nov. 13, 1907.	Nov. 6, 1907.	Oct. 9, 1907.	Nov. 14, 1906.
PIG IRON, Per Gross Ton:				
Foundry No. 2, Standard, Philadelphia	*$19.00*	$19.00	$20.00	$23.50
Foundry No. 2, Southern, Cincinnati	*19.75*	20.25	21.25	25.00
Foundry No. 2, Local, Chicago	*20.50*	21.50	22.50	24.50
Bessemer, Pittsburgh	*20.90*	20.90	22.90	22.85
Gray Forge, Pittsburgh	*19.40*	19.90	20.40	22.85
Lake Superior Charcoal, Chicago	*25.00*	25.50	26.50	23.50
BILLETS, &c., Per Gross Ton:				
Bessemer Billets, Pittsburgh	*28.00*	28.00	28.50	28.50
Forging Billets, Pittsburgh	*30.00*	30.00	31.00	36.00
Open Hearth Billets, Phila	*30.00*	30.00	31.00	33.00
Wire Rods, Pittsburgh	*34.00*	34.00	36.00	35.00
Steel Rails, Heavy, Eastern Mill	28.00	28.00	28.00	28.00
OLD MATERIAL, Per Gross Ton:				
Steel Rails, Melting, Chicago	*15.50*	16.00	17.00	20.50
Steel Rails, Melting, Phila	*13.50*	13.50	16.25	19.50
Iron Rails, Chicago	*19.00*	19.50	20.25	28.00
Iron Rails, Philadelphia	*19.00*	19.00	20.50	26.00
Car Wheels, Chicago	*23.00*	24.50	24.50	23.00
Car Wheels, Philadelphia	*19.00*	19.00	23.00	21.50
Heavy Steel Scrap, Pittsburgh	*15.00*	15.50	17.25	17.50
Heavy Steel Scrap, Chicago	*12.50*	14.00	15.00	17.50
Heavy Steel Scrap, Philadelphia	*13.50*	13.50	16.00	18.50
FINISHED IRON AND STEEL, Per Pound:	Cents.	Cents.	Cents.	Cents.
Refined Iron Bars, Philadelphia	1.75	1.75	1.75	1.83½
Common Iron Bars, Chicago	*1.75*	1.78	1.78	1.71½
Common Iron Bars, Pittsburgh	1.70	1.70	1.70	1.80
Steel Bars, Tidewater, New York	*1.76*	1.76	1.81	1.64½
Steel Bars, Pittsburgh	1.60	1.60	1.60	1.50
Tank Plates, Tidewater, New York	1.86	1.86	1.86	1.74½
Tank Plates, Pittsburgh	1.70	1.70	1.70	1.60
Beams, Tidewater, New York	1.86	1.86	1.86	1.84½
Beams, Pittsburgh	1.70	1.70	1.70	1.70
Angles, Tidewater, New York	1.86	1.86	1.86	1.84½
Angles, Pittsburgh	1.70	1.70	1.70	1.70
Skelp, Grooved Steel, Pittsburgh	*1.70*	1.70	1.85	1.57½
Skelp, Sheared Steel, Pittsburgh	*1.80*	1.80	1.95	1.60
SHEETS, NAILS AND WIRE, Per Pound:	Cents.	Cents.	Cents.	Cents.
Sheets, No. 27, Pittsburgh	2.50	2.50	2.50	2.50
Wire Nails, Pittsburgh	2.05	2.05	2.05	1.90
Cut Nails, Pittsburgh	*2.00*	2.05	2.10	1.95
Barb Wire, Galv., Pittsburgh	2.50	2.50	2.50	2.35
METALS, Per Pound:	Cents.	Cents.	Cents.	Cents.
Lake Copper, New York	**14.25**	14.50	14.00	22.50
Electrolytic Copper, New York	*13.50*	14.37½	13.62½	22.25
Spelter, New York	*5.15*	5.50	5.40	6.45
Spelter, St. Louis	*5.00*	5.35	5.40	6.35
Lead, New York	*4.55*	4.60	4.65	6.00
Lead, St. Louis	*4.35*	4.40	4.50	5.90
Tin, New York	*30.75*	30.60	33.00	42.65
Antimony, Hallett, New York	*10.00*	10.50	10.25	25.00
Nickel, New York	45.00	45.00	45.00	45.00
Tin Plate, 100 lb., New York	$4.09	$4.09	$4.09	$4.09

Chicago.

FISHER BUILDING, November 13, 1907.—(*By Telegraph.*)

The generally indulged hope that the tie-up occasioned by lack of money necessary for the ordinary needs of commerce would be of momentary consequence has been disappointed. Business has been brought practically to a standstill so far as new engagements are concerned. More or less trouble is experienced in meeting maturing obligations, especially where, as in the case of payrolls, actual currency is required. But a reassuring feature of the situation is found in the fact that the people generally are co-operating in measures taken to prevent the further complication of an already difficult financial status. So far employers have been able to meet payrolls in part at least with cash, and by official action some of the representative labor organizations have indorsed the substitution of checks for currency in payment of wages when necessary. It is of course needless to expect any general resumption of market activity until the banks are able to furnish a normal supply of money and extend the usual credit accommodation required for the ordinary transaction of business. The effects of the present unusual conditions are beginning to be felt in the agricultural districts owing to the lack of ready cash wherewith to move the crops. It is stated on good authority that fully 50 per cent. of the country elevators in the grain belt are closed because they cannot secure currency, the farmers declining to take checks which the banks will only honor for deposit. It is not believed that this state of affairs will be of long duration; in fact, the general tenor of reports indicates that the tension is already

slightly relaxed and another week should bring a definite degree of improvement. The Iron and Steel market for the past week has been without transactions of note. Hand to mouth buying of small lots of material absolutely required for present needs represents all that was done. Production of both raw and finished material is being curtailed by short operation or the entire shut down of plants. The bar mills of the Republic Iron & Steel Company at Moline, Ill., and East Chicago, Ind., are temporarily closed, and those of one other producer are running only part of the time. Six blast furnaces in the Chicago District and one in the Northern District have been blown out since the first of the month, but with one exception they were not important producers. Prices in most lines of Finished Material are firm, though slight concessions are obtainable on Sheets and Iron Bars. Light Rails and Spikes are also weak and susceptible of shading. Pig Iron is extremely dull. In fact, it may be said that the market is without any signs of active interest. Both seller and buyer are waiting the outcome of the financial situation, and there will be nothing doing until there is a definite change for the better in this respect and a stronger feeling of confidence established.

Pig Iron.—Trade is almost wholly suspended. The financial conditions are so restrictive that little could be done even if buyers were undeterred by other considerations from entering the market. There seems to be no other course open, therefore, than to await developments, and up to the present time the extreme monetary stringency has not been materially relieved. It is extremely doubtful if the entire engagements in this market for the past week have exceeded 1000 tons, the few sales that have been made being single carload lots for immediate delivery. One sale of 500 tons of No. 2 Foundry constitutes the only exception to this rule, and this was placed at a price around $20.50, Chicago. The dearth of actual transactions makes it impossible to fix the present level of values, except approximately. With no tonnage being offered or inquiries received, sellers are naturally enough making only nominal quotations. It is readily admitted, however, that should any good tonnage come into the market it would be met with prices considerably lower than those now quoted. How low they would be willing to go under such circumstances would be largely governed by the condition surrounding each individual transaction. Some of the sales made have been closed at as high as $17, Birmingham, for No. 2 Southern, and $21.50, Chicago, for Northern Foundry No. 2, but it is certain that better than these figures can be done on lots of 200 or 300 tons and upward. Everything points to weaker market conditions, and in view of the fact that desirable orders can be placed at prices below the range established by current transactions we have revised quotations. Numerous requests for the hold-up of deliveries on contracts are being received by all furnacemen. This is due in part to the slowness of collections and the consequent desire of purchasers to extend the dates of payment obligations. So far but few of the Northern furnaces have suspended operations, but a number of them have only orders enough on hand to keep them running a few weeks at most, and it is therefore likely that several will go out of blast in the near future, since conditions scarcely warrant the piling of Iron in yards. Altogether, there have been seven furnaces in the Lake District shut down since the first of the month, but the majority of these are small producers. The following prices are for November and December delivery, f.o.b. Chicago:

Lake Superior Charcoal	$25.00 to $25.50
Northern Coke Foundry, No. 1	21.00 to 21.50
Northern Coke Foundry, No. 2	20.50 to 21.00
Northern Coke Foundry, No. 3	20.00 to 20.50
Northern Scotch, No. 1	21.50 to 22.00
Ohio Strong Softeners, No. 1	21.50 to 22.00
Ohio Strong Softeners, No. 2	21.00 to 21.50
Southern Coke, No. 1	20.85 to 21.35
Southern Coke, No. 2	20.35 to 20.85
Southern Coke, No. 3	19.85 to 20.35
Southern Coke, No. 4	19.35 to 19.85
Southern Coke, No. 1 Soft	20.85 to 21.35
Southern Coke, No. 2 Soft	20.35 to 20.85
Southern Gray Forge	18.35 to 18.85
Southern Mottled	17.35 to 17.85
Malleable Bessemer	20.50 to 21.00
Standard Bessemer	22.40 to 22.90
Jackson Co. and Kentucky Silvery, 6 %	30.40 to 30.90
Jackson Co. and Kentucky Silvery, 8 %	32.40 to 32.90
Jackson Co. and Kentucky Silvery, 10 %	34.40 to 34.90

(*By Mail.*)

Billets and Rods.—The market is practically barren of orders or inquiries for Billets. Outside of two or three car lots no transactions in Forging Billets are reported. For business of this sort prices range from $33 to $34, Chicago. Wire Rods have not yet felt the effects of lessened demand to any considerable extent and are still quoted at $34 to $35, Pittsburgh.

Rails and Track Supplies.—Railroad interests seem for the present at least to have practically withdrawn from the Rail market. The only inquiry reported for last week was one of 1800 tons, and actual sales were limited to one lot of 500 tons taken by the Illinois Steel Company for immediate delivery. There is of course nothing doing in Track Supplies, nor is there likely to be any better demand until construction work is again actively resumed. Prices on Spikes and Light Rails lack firmness, and any round lot offers of either would likely induce substantial shading of present quotations, which are as follows: Angle Bars, accompanying Rail orders, 1907 delivery, 1.65c.; car lots, 1.75c. to 1.85c.; Spikes, 2c. to 2.10c., according to delivery; Track Bolts, 2.50c. to 2.60c., base, Square Nuts, and 2.65c. to 2.75c., base, Hexagon Nuts. The store prices on Track Supplies range from 0.15c. to 0.20c. above mill prices. Light Rails, 25 to 45 lb. sections, $32; 20-lb., $33; 16-lb., $34; 12-lb., $35, f.o.b. mill. Standard Sections, $28, f.o.b. mill, full freight to destination.

Structural Material.—With the exception of straggling orders of small tonnage, no new business has developed in Structural Material. The stringency of money effectually prevents the undertaking of large contracts. Even railroad bridge work, which has heretofore been furnishing a considerable amount of tonnage, has been arrested and nothing is now coming in from this source. An order of 675 tons for electric line towers at Colorado Springs was placed last week with the American Bridge Company. Notwithstanding present conditions, there is a large amount of new construction work planned, which would undoubtedly go ahead but for the difficulty in securing the needed funds. Local mills, though rapidly catching up on back orders, have specifications in hand to keep them comfortably busy for some weeks. Prices from store are quoted without change at 2.05c. to 2.10c., and mill prices at Chicago are as follows: Beams and Channels, 3 to 15 in., inclusive, 1.88c.; Angles, 3 to 6 in., ¼-in. and heavier, 1.88c.; larger than 6 in. on one or both legs, 1.98c.; Beams, larger than 15 in., 1.98c.; Zees, 3 in. and over, 1.88c.; Tees, 3 in. and over, 1.93c., in addition to the usual extras.

Plates.—Very little new business is coming out, and for the present no orders other than small lots for immediate requirements are being placed. There is, however, no disposition on part of the principal producers to offer price inducements for new tonnage, but it is reported that certain mills are shading prices from $1 to $2 a ton. Under present circumstances it is extremely unlikely that any considerable business would be developed by price concessions. Specifications against existing contracts are but moderate in volume. We quote for future delivery as follows: Tank Plates, ¼-in. and heavier, wider than 6¼ and up to 100 in. wide, inclusive, car lots, Chicago, 1.88c. to 2.08c.; 3-16 in., 1.98c. to 2.18c.; Nos. 7 and 8 gauge, 2.03c. to 2.23c.; No. 9, 2.13c. to 2.33c.; Flange quality, in widths up to 100 in., 1.98c. to 2.08c., base, for ¼-in. and heavier, with the same advance for lighter weights; Sketch Plates, Tank quality, 1.98c. to 2.18c.; Flange quality, 2.08c. Store prices on Plates are as follows: Tank Plates, ¼-in. and heavier, up to 72 in. wide, 2.20c. to 2.30c.; from 72 to 96 in. wide, 2.30c. to 2.40c.; 3-16 in. up to 60 in. wide, 2.30c. to 2.40c.; 72 in. wide, 2.50c. to 2.65c.; No. 8, up to 60 in. wide, 2.35c. to 2.45c., Flange and Head quality, 0.25c. extra.

Sheets.—The closing down of a number of mills has reduced the output considerably, but at the reduced rate at which new orders are coming in it will be sufficient to take care of the demand until a reaction sets in. Specifications against contracts are lagging somewhat, but the local mill is still fairly busy. Consumers display no interest in contracts for forward requirements, and are buying only in small lots for present needs. Sellers are not pressing for business and $2 a ton is the limit of concessions reported from ruling prices. We quote mill shipments as follows, Chicago: Blue Annealed, No. 10, 2.03c.; No. 12, 2.08c.; No. 14, 2.13c.; No. 16, 2.23c.; Box Annealed, Nos. 17 to 21, 2.53c.; Nos. 22 to 24, 2.58c.; Nos. 25 to 26, 2.63c.; No. 27, 2.68c.; No. 28, 2.78c.; No. 29, 2.88c.; No. 30, 2.98c.; Galvanized Sheets, Nos. 10 to 14, 2.83c.; Nos. 15 and 16, 3.03c.; Nos. 17 to 21, 3.18c.; Nos. 22 to 24, 3.33c.; Nos. 25 and 26, 3.53c.; No. 27, 3.73c.; No. 28, 3.93c.; No. 30, 4.43c. Sheets from store: Blue Annealed, No. 10, 2.30c.; No. 12, 2.35c.; No. 14, 2.40c.; No. 16, 2.50c.; Box Annealed, Nos. 18 to 21, 2.70c.; Nos. 22 to 24, 2.75c.; No. 26, 2.80c.; No. 27, 2.85c.; No. 28, 2.95c.; No. 30, 3.35c.; Galvanized from store: Nos. 10 to 16, 3.20c.; Nos. 18 to 20, 3.35c.; Nos. 22 to 24, 3.50c.; No. 26, 3.70c.; No. 27, 3.90c.; No. 28, 4.10c.; No. 30, 4.60c. to 4.65c.

Bars.—There is very little new business in either Steel or Iron Bars, and specifications for the former have fallen off considerably. Taking advantage of the situation, the Republic Iron & Steel Company has shut down its mills at Moline, Ill., and East Chicago, Ind., for overhauling and repairs. The volume of Bar Iron business developing is scarcely sufficient to keep local producers busy, one of whom, at least, is running but about three or four days per week. There has been some talk of weakness in Steel Bars, but so far as any actual concessions in this market is concerned such reports are believed to be without foundation. This is all the more probable since a cut of prices at the present time would not serve the interests of the large consumers. Bar Iron is reasonably firm at 1.75c.; but this price has been shaded somewhat by an outside interest; on account, however, of its small tonnage capacity the transactions re-

ferred to have but little significance. Quotations, Chicago, are as follows: Steel Bars, 1.78c., with half extras; Iron Bars, 1.75c.; Hoops, 2.18c., extras as per Hoop card; Bands, 1.78c., as per Bar card, half extras; Soft Steel Angles and Shapes, 1.88c., half extras. Store prices are as follows: Bar Iron, 2.10c. to 2.25c.; Steel Bars, 2c. to 2.10c.; Steel Bands, 2c., as per Bar card, half extras; Soft Steel Hoops, 2.35c. to 2.45c., full extras.

Merchant Pipe.—The demand has decreased considerably, and no large orders are being placed. Jobbers are buying in small lots for stock assortments, and the difficulty so long experienced in getting shipments has entirely disappeared. Prices have so far not been affected by the changed conditions, and are reported to be firm at quoted discounts, which are as follows from mill: Black Pipe, ¾ to 6 in., 71.2; 7 to 12 in., 68.2; Galvanized, ¾ to 6 in., 61.2. These discounts are subject to 1 point on the base. From store in small lots Chicago jobbers quote 68 per cent. on Black Steel Pipe, ¾ to 6 in. About 4 points advance above these prices is asked for Iron Pipe.

Boiler Tubes.—There is less demand from boiler makers who are ordering in small quantities chiefly from jobbers' stocks to supply current needs. No irregularity is reported in prices on Merchant Tubes, but in Locomotive Tubes some concessions are being made. Mill quotations for future delivery on the base sizes are as follows: 2⅜ to 5 in., in carload lots, Steel Tubes, 63.2; Iron, 50.2; Seamless, 49.2; 2½ in. and smaller, and lengths over 18 ft., and 2½ in. and larger, and lengths over 22 ft., 10 per cent. extra. Store prices are as follows:

	Steel.	Iron.	Seamless.
1 to 1½ in.	35	35	35
1¾ to 2¼ in.	50	35	35
2½ in.	52½	35	35
2¾ to 5 in.	60	47½	47½
6 in. and larger	50	35	..

Merchant Steel.—There is practically no new business coming out and specifications are only fair. Quotations are as follows: Planished or Smooth Finished Tire Steel, 1.98c.; Iron Finish up to 1½ x ½ in., 1.93c.; Iron Finish, 1½ x ½ in. and larger, 1.78c., base; Channels for solid Rubber Tires, ¾ to 1 in., 2.28c., and 1⅛ in. and larger, 2.18c.; Smooth Finished Machinery Steel, 2.18c.; Flat Sleigh Shoe, 1.93c.; Concave and Convex Sleigh Shoe, 2.08c.; Cutter Shoe, 2.46½c.; Toe Calk Steel, 2.33c.; Railroad Spring, 1.98c.; Crucible Tool Steel, 7¼c. to 8c., and still higher prices are asked on special grades. Shafting, 54 per cent. off in car lots; 48 per cent., less than car lots, base territory delivery.

Cast Iron Pipe.—The market is almost wholly dependent for new tonnage upon such small lots as are imperatively demanded for maintenance work. No new lettings, large or small, are reported this week, nor are there any of importance in sight for the near future. Prices quoted would likely be shaded on an offer of desirable tonnage. We quote, per net ton, Chicago, as follows: Water Pipe, 4-in., $36; 6 to 12 in., $35; 16-in. and up, $34, with $1 extra for Gas Pipe.

Coke.—The demand is confined to carload business for present needs, and even business of this character is extremely light. Buyers are making no contracts for future delivery. Prices are somewhat easier, and we now quote 72-hr. Connellsville Coke for prompt shipment at $3 to $3.25, at oven.

Metals.—Conditions have been distinctly unfavorable to the maintenance of the recent advance in Copper. Scarcity of money has effectually barred any active buying movement that otherwise might have taken place. Prices have this week receded slightly, being off about ½c. from last week's figures. Other Metals are quiet and unchanged. We quote as follows: Casting Copper, 15c.; Lake, 16c., in car lots for prompt shipment; small lots, ¼c. to ⅜c. higher; Pig Tin, car lots, 34½c.; small lots, 34¾c.; Lead, Desilverized, 5c. to 5.10c., for 50-ton lots; Corroding, 6c. to 6.10c., for 50-ton lots; in car lots, 2¼c. per 100 lb. higher; Spelter, 5.65c.; Cookson's Antimony, 13c., and other grades, 12c. to 12½c.; Sheet Zinc is $7.50 list, f.o.b. La Salle, in car lots of 600-lb. casks. On Old Metals we quote: Copper Wire, 14c.; Heavy Copper, 14c.; Copper Bottoms, 12½c.; Copper Clips, 12½c.; Red Brass, 14c.; Yellow Brass, 10½c.; Light Brass, 7¼c.; Lead Pipe, 5c.; Zinc, 4½c.; Pewter, No. 1, 23c.; Tin Foil, 27c.; Block Tin Pipe, 30c.

Old Material.—Without support in any quarter the market has slumped heavily. Such sales as were made, and they were few and unimportant, were generally closed at the buyers' offer. The railroad lists offered are reported to have brought prices considerably below last week's quotations. The closing down of some mills and the shortened production of others of course lend little encouragement for any considerable demand from this source. The situation among melters is little, if any, more promising, and under these conditions a strong market is seemingly out of the question. Railroad lists to be offered this week aggregate a total of nearly 17,000 tons, distributed as follows: Santa Fé, 3000 tons; Baltimore & Ohio, 9500 tons; Chicago & Northwestern, 1500 tons; Chicago, Milwaukee & St. Paul, 1500 tons; Southern, 1350 tons. It is also reported that in addition to the material offered, a large amount of tonnage has accumulated in railroad yards. We quote per gross ton, f.o.b. Chicago, as follows:

Old Iron Rails	$19.00 to $19.50
Old Steel Rails, rerolled	16.00 to 16.50
Old Steel Rails, less than 3 ft.	15.50 to 16.00
Relaying Rails, standard sections, subject to inspection	26.00 to 28.00
Old Car Wheels	23.00 to 23.50
Heavy Melting Steel Scrap	12.50 to 13.00
Frogs, Switches and Guards, cut apart	12.75 to 13.25
Mixed Steel	10.00 to 10.50

The following quotations are per net ton:

Iron Fish Plates	$15.25 to $15.75
Iron Car Axles	22.00 to 22.50
Steel Car Axles	17.50 to 18.00
No. 1 Railroad Wrought	12.50 to 13.00
No. 2 Railroad Wrought	11.50 to 12.00
Railway Springs	11.00 to 11.50
Locomotive Tires, smooth	17.00 to 17.50
No. 1 Dealers' Forge	10.00 to 10.50
Mixed Busheling	8.50 to 9.00
Iron Axle Turnings	8.50 to 9.00
Soft Steel Axle Turnings	8.50 to 9.00
Machine Shop Turnings	8.50 to 9.00
Cast Borings	7.25 to 7.75
Mixed Borings, &c.	7.25 to 7.75
No. 1 Mill	7.75 to 8.25
No. 2 Mill	7.00 to 7.50
No. 1 Boilers, cut to Sheets and Rings	8.50 to 9.00
No. 1 Cast Scrap	14.00 to 14.50
Stove Plate and Light Cast Scrap	13.00 to 13.50
Railroad Malleable	12.00 to 12.50
Agricultural Malleable	12.50 to 13.00
Pipes and Flues	9.00 to 9.50

Birmingham.

BIRMINGHAM, ALA., November 11, 1907.

Pig Iron.—Further curtailment of production and consumption is noted during the past week, which more clearly indicates the unsettled condition of the market. Cancellations of tonnage due on contracts are being effected in many cases, and as a result order books are being rapidly cleaned up and producers are finding it necessary either to allow an accumulation of stock or reduce their output. It is generally conceded that the latter policy will be pursued, owing to the high cost at which furnaces are being operated, and no doubt still further curtailment will be made within the next 30 days. No stock of any consequence is found on furnace yards, especially is this true of low grades, and the chances are that, when the market is again active, producers will be in good shape to adjust themselves to changed conditions. Melters continue chary as to negotiating for more than immediate requirements and very little Iron is to be found on their yards. Bids considerably under quotations of leading interests have been made for future deliveries, but sellers are maintaining an attitude of independence and such offers are receiving little consideration. It is generally understood that offers are only to feel the market and that buyers would not engage tonnage if concessions were made. Furnacemen who are well sold up for the remainder of the year continue to ask $18.50 on a No. 2 Foundry basis, but those who have not been so fortunate are disposed to take considerably less. Small lots of No. 2 Soft are reported sold for $17.50, and the former differential of $1 per ton for lower grades could no doubt be done. Additional resale Iron is being offered, and No. 4 Foundry has been sold for $15, although $16.50 appears to be the best offer for No. 2 Soft.

Cast Iron Pipe.—The market is dull and the prospects for future business are not encouraging. Local plants seem well supplied with orders for small lots, but with the exception of the tonnage recently placed for Cuba no large contracts are in evidence. It is learned that the opening of bids for Tucson, Ariz., has been deferred until January, 1908. Atlanta, Ga., will open bids November 11 for quite an attractive tonnage of Water Pipe, which is the only new business reported. Prices are unchanged and quotations on small lots of Water Pipe are as follows, per net ton, f.o.b. cars here: 4 to 6 in., $34; 8 to 12 in., $33; over 12-in., average, $30, with $1 per ton extra for Gas Pipe. On large municipal contracts and for delivery in competitive territory these prices are shaded.

Old Material.—During the past week inquiries have been more frequent and dealers are somewhat encouraged. Small sales of Cast Scrap for immediate consumption have been made, but no disposition to cover for future requirements is apparent with consumers. Stocks continue to accumulate, and quite a volume of this material is in evidence. Dealers' quotations are about as follows, per gross ton, f.o.b. cars here:

Old Iron Rails	$22.00 to $22.50
Old Iron Axles	18.50 to 19.00
Old Steel Axles	17.00 to 17.50
Old Car Wheels	20.50 to 21.00
No. 1 Railroad Wrought	17.50 to 18.00
No. 2 Railroad Wrought	13.00 to 13.50
No. 1 Country Wrought	14.50 to 15.00
No. 2 Country Wrought	12.00 to 12.50
Wrought Pipe and Flues	13.50 to 14.00
Railroad Malleable	14.00 to 14.50
No. 1 Steel	13.50 to 14.00
No. 1 Machinery Cast	14.25 to 14.75
Stove Plate and Light Cast	10.25 to 10.75
Cast Borings	7.75 to 8.25

Pittsburgh.

PARK BUILDING, November 13, 1907.—(*By Telegraph.*)

Pig Iron.—There is absolutely nothing doing in Pig Iron in the way of new sales, offers of metal at extremely low prices failing to induce buying. Furnaces realize that it is almost useless to try to do business under present conditions. Bessemer Iron is nominally $20, Valley furnace, but if anybody wanted some it could be bought at $19, at furnace, and possibly less. Basic has been offered at $18, Valley furnace, or $18.90, Pittsburgh, and declined. Northern No. 2 Foundry, for prompt delivery, is $19.50 to $20, Valley furnace, but a lower price would be made on large tonnage for future delivery. There is nothing doing in Gray Forge, and $18.50, Valley furnace, or $19.40, Pittsburgh, is a nominal price, which could be materially shaded on a firm offer.

Coke.—The H. C. Frick Coke Company, which has about 18,000 ovens in the Connellsville region, has closed down about 3000 ovens, and is working the rest five days a week. Independent Coke operators are also blowing out ovens at a rapid rate, and it is estimated that the output of Coke has been reduced fully 30 per cent. Prices are much lower, and Connellsville Foundry Coke has sold as low as $2.25 a ton, at oven.

Steel.—Consumers of Billets and Sheet and Tin Bars are covered to the end of the year, and the market is stagnant as regards new business. Bessemer and Open Hearth Billets are nominally $28, Pittsburgh, but there are no sales, the steel makers not trying to force business under present conditions. Sheet and Tin Bars remain at $31, but this price will be adjusted to a lower basis commencing January 1, to conform to the lower prices on Billets.

(*By Mail.*)

The leading interests are giving almost their entire attention to cutting down the output of Pig Iron, Steel and Finished Material, rather than to making an effort to secure new business, of which there is practically none being offered. Present conditions in the Steel trade are without precedent, and how long they will last is a problem. The opinion is general that local banks have probably been overconservative, and while their efforts to hold fast to their currency are to be commended, in view of possible runs on these institutions, yet this conservatism has been carried to such a point as to receive severe criticism from business interests. The matter of credits is being scanned more closely now than ever before, and offers of large consumers to pay for material with notes are met with refusal and the tonnage is held up. Large employers of labor continue to pay their men with clearing house checks to the extent of about 80 per cent., and while these have caused more or less confusion, the men understand the situation better than they did at first, and there is less objection. And not enough material of any kind is being sold on which to base market quotations. The financial trouble of the New York State Steel Company resulted in a large block of Basic Pig Iron being offered to leading Steel interests in this city at an extremely low price, but the Iron was refused as those to whom it was offered could not use it. The nominal price of Bessemer Iron is about $20, Valley furnace, but if any business was offering possibly less would be done. The only demand for Pig Iron of any kind is for small lots for actual needs, and a great deal of Iron continues to be offered for resale by consumers. Practically no tonnage is being placed in Steel, but the nominal price of Bessemer and Open Hearth Billets is continued at $28, Pittsburgh. The makers of Steel Billets, and also of Sheet and Tin Bars, as the result of recent conferences, are not trying to force sales, but are rather concerned in keeping stocks of Billets and Bars from piling up. Consumers are covered up to the close of the year, and when January 1 comes the prices of Billets and Sheet and Tin Bars will be adjusted to meet conditions existing at that time. While little new tonnage is being placed in Finished Iron and Steel, a remarkable feature of the situation is that prices are being well sustained. Manufacturers realize that to reduce prices on any commodity at this time would simply add to the uncertainty, and would not bring out any new business. At this writing 28 or 29 blast furnaces in the Pittsburgh, Cleveland and Valley districts are down and more stacks will be blown out in the next week or two. Much outside work has been shut off, and thousands of men are idle that were employed at good wages a month ago. Leading bankers and manufacturers believe that by January 1 the financial situation will be much better, and if this comes an improvement in the Steel business will quickly follow.

Ferromanganese.—Several lots are being offered for resale by consumers, who are over bought, and the market price of 80 per cent. is about $53, Pittsburgh. It is likely, however, that a lower price could be made to a consumer that would agree to take in Ferro at once.

Muck Bar.—We do not hear of any sales on which to base prices, and we quote best grades of Muck Bar made from all Pig Iron at about $33, Pittsburgh.

Skelp.—Specifications against contracts are not coming in freely, and a good deal of tonnage is being held up. We do not hear of any new business offering, and quote nominally as follows: Grooved Steel Skelp at 1.70c. to 1.75c.; Sheared Steel Skelp, 1.80c.; Grooved Iron Skelp, 1.90c., and Sheared, 2c. to 2.10c., depending on sizes and widths. These prices are f.o.b. maker's mill, and could probably be shaded if any new business was offering.

Steel Rails.—Daily press reports that the Pennsylvania, New York Central and other leading lines would soon place a large tonnage in Steel Rails are untrue. It is a fact that five or six of the main roads made up their requirements for next year some time ago, aggregating about 1,000,000 tons, but this tonnage will hardly come out until financial conditions are better. In the meantime, practically no new tonnage is being placed, and several railroads that offered to pay for Rails in notes have been advised that shipments on their contracts cannot be made under these terms. The Edgar Thomson mill of the Carnegie Steel Company is turning out about 1500 tons of Rails per day, but this output will be further cut within a short time unless some contracts are placed. There is little demand for Light Rails, and low prices being made on the small tonnage offering. We quote Light Rails as follows: 25 to 45 lb., $30; 20-lb., $31; 16-lb., $32; 12-lb., $34; 10-lb., $36, and 8-lb., $40. We quote Standard Sections at $28, at mill, and Angle Splice Bars at 1.65c., at mill.

Plates.—Little new tonnage is coming out, the mills running almost entirely on contracts. The Steel car interests are taking out almost their full quota of Plates, but after January 1 some of these concerns will have their contracts for cars pretty well cleaned up, and their consumption will then not be as heavy unless some orders for cars are received in the meantime. Prices on Plates continue to be shaded by some mills to the extent of about $2 a ton. We quote: Tank Plates, ¼-in. thick, 6¼ in. up to 100 in. wide, 1.70c., base, at mills, Pittsburgh. Extras over this price are as follows:

	Extra per 100 lb.
Gauges lighter than ¼-in. to and including 3-16-in. Plates on thin edges	$0.10
Gauges Nos. 7 and 8	.15
Gauge No. 9	.25
Plates over 100 to 110 in.	.05
Plates over 110 to 115 in.	.10
Plates over 115 to 120 in.	.15
Plates over 120 to 125 in.	.25
Plates over 125 to 130 in.	.50
Plates over 130 in.	1.00
All sketches (excepting straight taper Plates varying not more than 4 in. in width at ends, narrowest end being not less than 30 in.)	.10
Complete Circles	.20
Boiler and Flange Steel Plates	.10
"A. B. M. A." and ordinary Firebox Steel Plates	.20
Still Bottom Steel	.30
Marine Steel	.40

Shell grade of steel is abandoned.

TERMS.—Net cash 30 days. Pacific Coast base, 1.60c., f.o.b. Pittsburgh, with all rail tariff rate of freight to destination added, no reduction for rectangular shapes, 14 in. wide down to 6 in. of Tank, Ship or Bridge quality.

Structural Material.—No large work has come out for some little time, and none is expected until financial conditions improve. Structural shops are pretty well caught up with work on hand, and will soon commence to cut down output and lay off men. Two or three local jobs involving about 2500 tons are in sight, but it will probably be some little time before these are given out. We quote: Beams and Channels, up to 15 in., 1.70c.; over 15 in., 1.80c.; Angles, 3 x 2 x ¼ in. thick, up to 6 x 6 in., 1.70c.; 8 x 8 and 7 x 3½ in., 1.80c.; Zees, 3 in. and larger, 1.70c.; Tees, 3 in. and larger, 1.75c.; Bulb Angles and Deck Beams, 2c. Under the Steel Bar card Angles, Channels and Tees under 3 in. are 1.70c., base, for Bessemer and Open Hearth, subject to half extras on the Standard Steel Bar card.

Sheets.—The La Belle Iron Works, Steubenville, Ohio, has started up one of its new jobbing mills, the product being Blue Annealed Sheets. New demand for Sheets continues light, and while some tonnage has been held up specifications are coming in at a fairly satisfactory rate. Prices on Galvanized Sheets continue quite strong, but on Black and Painted Roofing Sheets are being shaded about $2 a ton. Regular prices are as follows: Blue Annealed Sheets, No. 10 gauge and heavier, 1.85c.; Nos. 11 and 12, 1.90c.; Nos. 13 and 14, 1.95c.; Nos. 15 and 16, 2.05c.; Box Annealed, Nos. 17 to 21, 2.35c.; Nos. 22 to 24, 2.40c.; Nos. 25 and 26, 2.45c.; No. 27, 2.50c.; No. 28, 2.60c.; No. 29, 2.75c.; No. 30, 2.85c. We quote Galvanized Sheets as follows: Nos. 10 and 11, 2.65c.; Nos. 12 and 14, 2.75c.; Nos. 15 and 16, 2.85c.; Nos. 17 to 21, 3c.; Nos. 22 and 24, 3.15c.; Nos. 25 and 26, 3.35c.; No. 27, 3.55c.; No. 28, 3.75c.; No. 29, 4c., and No. 30, 4.25c. We quote No. 2 gauge Painted Roofing Sheets at $1.85 per square, and Galvanized Roofing Sheets, No. 28 gauge, $3.25 per square, for 2-in. corruga-

tions. These prices are for carload lots, jobbers charging the usual advances.

Tin Plate.—Conditions in this trade are about as noted in this report for several weeks. The demand is dull, but in spite of this we are advised that prices are being very well maintained. Leading interests have cut down the output of Tin Plate materially and will make strong efforts to prevent the accumulation of stocks during this dull period. We quote $3.90 for 100-lb. Cokes, 14 x 20, f.o.b. Pittsburgh, terms 30 days, less 2 per cent. off for cash in 10 days, on which price a rebate of 5c. a box is allowed for carload and larger lots.

Iron and Steel Bars.—A fair volume of business is coming to the mills in specifications against contracts, but new business in both Iron and Steel Bars is light. Some concessions are being made in prices of Iron Bars, but we are advised that the fixed price of 1.60c., Pittsburgh, on Steel Bars, is being maintained. We continue to quote Steel Bars at 1.60c., base, Pittsburgh, and Iron Bars at 1.70c., Pittsburgh, for delivery in the Pittsburgh District, and 1.60c., Pittsburgh, for Western shipment. However, these prices on Iron Bars would likely be shaded if any large tonnage was offering.

Spelter.—Some new tonnage is being placed, but prices are weak. We quote prime grades of Western Spelter at about 5.12½c., St. Louis, or 5.25c., Pittsburgh. Consumers claim that if they were ready to buy they could place tonnage at lower figures.

Spikes.—The demand for smaller sizes is fair, but very little new business is being placed in the standard sizes, on which prices are rather weak. We quote Railroad Spikes at $1.90 to $1.95, and smaller sizes at $2.05 to $2.10, per 100 lb., f.o.b. Pittsburgh.

Merchant Steel.—The little new business now being placed is only for small lots. Specifications against contracts are only fair, and a number of leading mills are cutting down their output. We quote Cold Rolled Shafting at 54 per cent. off in large lots and 48 per cent. off in carload lots, delivered in base territory; Smooth Finished Machinery Steel, 1.85c. to 2c., depending on quality; Flat Sleigh Shoe, 1.65c. to 1.75c.; Cutter Shoe, 2.15c. to 2.20c.; Toe Calk Steel, 2.10c. to 2.15c.; Railroad Spring Steel, 1.75c. to 1.80c.; Crucible Tool Steel, 6c. to 8c. for ordinary grades, and 10c. and upward for special grades.

Merchant Pipe.—The new tonnage being placed is growing less in volume, the mills running largely on specifications against contracts. Makers of Pipe realize that it is useless to attempt to force sales under present conditions, and are inclined to take things easy until the money situation has cleared up. Prices on Steel Pipe are being maintained, but on Iron Pipe are being shaded. The net discount on ¾ to 6 in. Merchant Steel Pipe is 74 and 5 per cent. off list. Discounts on Steel Pipe are as follows:

Merchant Pipe.

	Jobbers, carloads. Steel.	
	Black.	Galv.
	%	%
⅛ to ¼ in.	65	49
⅜ in.	67	53
½ in.	69	57
¾ to 6 in.	73	63
7 to 12 in.	70	55
Extra strong, plain ends:		
⅛ to ⅜ in.	58	46
½ to 4 in.	65	53
4½ to 8 in.	61	49
Double extra strong, plain ends:		
½ to 8 in.	54	43

To the large trade all above discounts are subject to 1 point on the base, and 5 per cent. on the net.

Discounts on Iron Pipe, which are shaded 2 points or more to the large trade, are as follows, f.o.b. Pittsburgh:

Standard Genuine Iron Pipe.

	Black.	Galv.
	%	%
¾ to 6 in.	67	57
½ in.	62	50
⅜ in.	60	42
⅛ and ¼ in.	58	42
7 to 12 in.	62	47
Extra Heavy Iron Pipe, Plain Ends.		
⅛, ¼ and ⅜ in.	62	40
½ to 4 in.	59	47
4½ to 8 in.	55	42

Boiler Tubes.—A fair amount of tonnage is moving in Merchant Tubes, but there is little inquiry for Railroad Tubes, some low prices being made on the small amount of tonnage that is coming up. It is stated that discounts on Merchant Tubes are being well maintained, as follows:

Boiler Tubes.

	Iron.	Steel.
1 to 1¼ in.	42	47
1¾ to 2¼ in.	42	59
2½ in.	47	61
2¾ to 5 in.	52	65
6 to 13 in.	42	59

2½ in. and smaller, over 18 ft. long, 10 per cent. net extra.
2¾ in. and larger, over 22 ft. long, 10 per cent. net extra.

Iron and Steel Scrap.—Not enough tonnage in Scrap is being sold on which to base prices. Heavy Steel Scrap has been offered in the past week at $15 a ton and declined. The market is anything that consumers care to offer, and they usually decline to take in Scrap at any price except in small lots for actual needs. Our quotations are merely nominal, and if any tonnage was offering there would be no trouble in getting Material at lower prices than are quoted by dealers, and which are about as follows: Heavy Steel Scrap, for Sharon, Steubenville or Pittsburgh delivery, $15; Bundled Sheet Scrap, $13 to $13.50; No. 1 Railroad Wrought Scrap, $16; No. 2, $15 to $15.50; Rerolling Rails, $16.25 to $16.50; No. 1 Cast Scrap, $17 to $17.50; Cast Iron Borings, $11; Old Steel Rails, short pieces, for open hearth use, $15.50; Low Phosphorus Melting Stock, $19 to $19.50; Steel Axles, $21 to $21.50; No. 1 Busheling Scrap, $15; No. 2, $11.75 to $12; Old Car Wheels, $22.50 to $23; Standard Sheet Bar Crop Ends, $18.50 to $19; Grate Bars, $15; Stove Plate, $13.50, net ton. All above prices are per gross ton, f.o.b. Pittsburgh, unless otherwise noted.

Coke.—The shutting down of so many blast furnaces in the Pittsburgh and Valley Districts has made a big hole in the demand for Coke, which is duller at present than for some time, and prices are easier. Connellsville Furnace Coke for prompt shipment could be readily secured at $2.65 to $2.75 a ton at oven, and possibly less. Foundry Coke is also easier, and leading Coke interests are more concerned just now in keeping down the output than in trying to secure business.

Philadelphia.

PHILADELPHIA, PA., November 12, 1907.

Conditions in the Iron and Steel markets continue without material change. The apathetic feeling which has prevailed during the past few weeks prevails, and the volume of new business which has been done in the various branches of the trade has been extremely small. Buyers appear to be taking no interest in the market whatever and sellers are not inclined to force business at the present level of prices. The financial situation, while apparently improved, is still exerting a pronounced influence in trade circles, and business is held up all along the line, pending more satisfactory arrangements. The scarcity of money has handicapped both buyers and sellers to a material extent, and difficulties have been experienced in some directions in obtaining sufficient funds to conduct business satisfactorily. The situation on the whole is hard to analyze. In many cases there has been almost an entire absence of sales of some grades of material, and in the lack of business it is difficult to say what actual prices are, or what they would be should an actual buyer for round lot of material for future delivery come out. Under ordinary circumstances, however, the appearance of such a buyer would no doubt be something of a surprise, inasmuch as consumers in nearly all cases are unable to judge with any degree of certainty what their needs for the next six months or even for the next three months will be, and they are therefore quite willing to drift along, taking from time to time such small tonnages of raw materials as are required for their immediate wants. Rolling mills and other manufacturing plants are in a number of instances operating on reduced time, in some cases at only half their capacity, while in others systematic reductions in working forces are being made from week to week. Under such conditions, it is evident, it is hard to forecast the future.

Pig Iron.—The week's business will probably aggregate as low a total tonnage as the trade has known for some time. But little interest is shown in the market either by buyer or seller, and there has scarcely been enough done to establish a market. Quotations, therefore, are hard to make with accuracy. The market, generally speaking, is probably a shade firmer. At least prices have not receded any during the week, and it is thought that the bottom has about been reached. Pig Iron makers in some cases cannot make both ends meet at the present level of prices, and unless they have unfilled contracts at higher prices still on their books they face a loss on every ton of Iron made. That this condition will not be permitted to continue is evident, and instead of storing Iron furnaces will be blown out. A number have already been blown out for repairs, and as a rule these will not be blown in again until prices reach a level where they can be operated profitably or the cost of production is reduced. Production during October was larger than was anticipated, and while a number of furnaces went out during the closing days, the output for the month was scarcely affected. Since November 1, however, there has been a still greater blowing out of furnaces, and production during the present month will, without doubt, show a very sharp falling off, particularly on the part of the merchant furnaces. Most of the business done during the week has been confined to small lots, carloads for immediate shipment predominating. There has been some scattered inquiry for Iron for delivery over the next three to six months, but buyers want concessions, which sellers are not inclined to meet, as it is thought by them that prices will be stronger after production and consumption get nearer together. While there has been some holding up on the delivery of Iron

under contract, particularly on the part of mills, sellers are pretty well satisfied with the way Iron has been taken by the foundries, and stocks on the furnace banks are not large. Stocks in consumers' yards are also small, except on the part of the large melters, who had purchased heavily earlier for their full year's needs, and who have been accumulating Iron owing to the decreased consumption, which makes it all the more uncertain as to their requirements for the early portion of next year. Under the circumstances there is no business being done for next year's delivery, both buyers and sellers being willing to wait until the situation attains a more tangible shape before taking hold in any way for future supplies. Buying has been confined almost entirely to the Foundry grades, No. 2 X being sold in varying small tonnages from $19 to $19.50, delivered. Forge Irons have been dull. A few sales of 100-ton lots have been made for prompt shipment at $17.50. No sales of Basic have been reported. Basic could probably be done under $18, but as there are no immediate buyers, sellers are naming no prices. An inquiry for a small tonnage, covering deliveries for the next five months, has come out, but sellers do not feel inclined to quote to-day's prices for delivery so long ahead under the existing conditions. Low Phosphorus Iron has been quiet, although there have been some small lots of misfit grades sold at varying prices. Prices generally are named for early shipment and cover small tonnages only. What they would be for large lots or for future delivery is difficult to say at this time. While quotations are more or less nominal, prices for delivery in buyers' yards during the remainder of the year, eastern Pennsylvania and adjoining territory, range about as follows:

No. 2 X Foundry	$19.00 to $19.50
Gray Forge	17.00 to 17.75
Basic	18.00 to 18.25
Low Phosphorus	26.00 to 26.50

Ferromanganese.—Business has been quiet, and what little has been done has been confined to small lots for early delivery. For November or December shipment prices are quoted close to $53, but this could no doubt be shaded if business came out in any large tonnage.

Steel.—There is practically no change in the demand. Buyers are not placing orders in any quantity and new business is light. Mills are only running about one-half their capacity. Prices are nominally quoted at $30 to $31 for ordinary Steel and $33 to $35 for Forging Steel, but would be shaded on any desirable business.

Plates.—Little new business is coming out, although there is considerable figuring being done, and the outlook is considered somewhat more favorable. The local shipyards are figuring on some extensive work, and other Plate consumers seem to be a little more active. No large tonnages, however, have been placed as yet, and mills are not very fully occupied. Officially, prices are unchanged, but there would be no difficulty experienced in obtaining a concession on to-day's prices should a desirable lot of business come on the market. Quotations are as follows:

	Carload. Cents.	Part carload. Cents.
Tank, Bridge and Boat Steel	1.85	1.90
Flange or Boiler Steel	1.95	2.05
Commercial Firebox	2.05	2.10
Marine	2.25	2.30
Locomotive Firebox Steel	2.35	2.40
The above are base prices for ¼-in. and heavier. The following extras apply:		Extra per 100 lb.
3-16-in. thick		$0.10
Nos. 7 and 8, B. W. G.		.15
No. 9, B. W. G.		.25
Plates over 100 to 110 in.		.05
Plates over 110 to 115 in.		.10
Plates over 115 to 120 in.		.15
Plates over 120 to 125 in.		.25
Plates over 125 to 130 in.		.50
Plates over 130 in.		1.00

Structural Material.—The demand for Structural Material continues fairly good. Mills are taking orders for small and medium lots of a miscellaneous character, and are still pretty well occupied. Some smaller office buiding work has been reported as being almost ready for bids, while there is also a sprinkling of small bridge work. The city recently placed orders for a medium sized lot of materials for this class of work. Prices are being pretty well maintained at 1.85c. to 2c., according to specification.

Bars.—The demand for Bars continues unsatisfactory. New business is light, and specifications against old contracts are not coming out at all freely, so that mills are not fully occupied. While prices are quoted from 1.75c. to 1.80c. for Refined Iron Bars, they are not strong, and reports of cutting have been heard. Steel Bars can be had at the same price, and have improved materially in delivery.

Sheets.—There has been but little business done, and mills are running at about half their capacity. Buyers are taking supplies in limited quantities only, absolutely nothing being done for future delivery. Prices remain unchanged, and are quoted as follows for mill shipments, a tenth extra being quoted for small lots: Nos. 18 to 20, 2.80c.; Nos. 22 to 24, 2.90c.; Nos. 25 to 26, 3c.; No. 27, 3.10c., and No. 28, 3.20c.

Old Material.—There is practically no market for Old Material of any kind. Buyers have held up shipments in many cases and the business done has been extremely light. Prices are unchanged owing largely to the lack of business, and transactions are for prompt shipment only. Bids and offers for delivery in buyers' yards are nominally quoted about as follows:

No. 1 Steel Scrap and Crops	$13.50 to $14.00
Low Phosphorus	18.50 to 19.00
Old Steel Axles	20.00 to 20.50
Old Iron Axles	25.00 to 26.00
Old Iron Rails	19.00 to 19.50
Old Car Wheels	19.00 to 20.00
Choice No. 1 R. R. Wrought	16.00 to 16.50
Machinery Cast	17.00 to 17.50
Wrought Iron Pipe	13.50 to 14.00
No. 1 Forge Fire Scrap	12.50 to 13.00
No. 2 Light Iron	8.50 to 9.00
Wrought Turnings	11.00 to 11.50
Stove Plate	13.00 to 13.50
Cast Borings	8.50 to 9.00
Grate Bars	13.50 to 14.00

San Francisco.

SAN FRANCISCO, November 7, 1907.

Structural Steel.—Good progress has been made recently in the erection of Steel on a number of tall buildings. The contract for the Postal Telegraph Building calls for 750 tons. The building permits for the month of October considerably exceeded $2,000,000 in total valuation, notwithstanding the financial stringency and the opening of the rainy season. Shipments of Steel are arriving in good time with the exception of those for the Palace Hotel.

Pig Iron.—Stocks in dealers' hands are low in this city, and receipts from Europe have been light for some time. A number of sailing vessels en route from European ports seeking return cargoes of grain have on board an average of about 1000 tons of Pig Iron each. Several of the large iron works of this city still have good stocks of Pig Iron in their yards, as they made heavy purchases when business was rushing and consumption has been light for some months. There is but little change in prices of European Pig Iron here.

Merchant Pipe.—There is a good volume of new business in Merchant Pipe, with fair local stocks. Prices are practically unchanged. Discounts on Steel Pipe are as follows:

	Steel. Black. %	Steel. Galv. %
⅛ and ¼ in.	58.5	42.5
⅜ in.	60.5	46.5
½ in.	62.5	50.5
¾ to 6 in.	66.5	56.5
7 to 12 in.	63.5	48.5
Extra Strong, Plain Ends:		
⅛ to ⅜ in.	51.5	39.5
½ to 4 in.	58.5	46.5
4½ to 8 in.	54.5	42.5
Double Extra Strong, Plain Ends:		
½ to 8 in.	47.5	36.5

Cast Iron Pipe.—There are only fair inquiries, and mostly for small lots. Shipments are coming along from the East in better shape. A good deal of work is being held up on a number of projected water works extensions on account of scarcity of money. The cities of Tucson and Phœnix, Ariz., have planned to order about 6000 tons of Cast Iron Pipe between them, but on account of difficulties in floating bonds action by the former city will be deferred until January 6. Prices, per net ton, San Francisco, are as follows: 6, 8, 10 and 12 in., $43; 4-in., $44.

Bars.—Business is quiet here, and credits are being watched pretty closely, but collections are no worse than for some weeks. Bar Iron is selling on a $2.45 to $2.65 base. Steel Bars are quoted at the same prices and stocks are in good condition; not very large.

Sheets.—Stocks are not large in this city, but there is no serious shortage in Galvanized Sheets, which are selling at $4.75 to $4.85 for No. 26, with the usual differentials for other sizes. Black Sheets are quoted at about $4.25, San Francisco warehouse, for No. 28.

Plates.—Inactivity continues in Plates and allied lines in San Francisco on account of the political and financial situation. Prices are unchanged.

Scrap Iron and Steel.—Business is quiet. Moderate stocks are on hand, and there is still quite a lot of metal to be dug out of the burned district. Most of this, however, was purchased on the ground some time ago by large dealers in Scrap. The Great Western Smelting & Refining Company, 75 Folsom street, quotes the following prices to dealers per net ton:

Cast Scrap	$15.00 to $15.50
Wrought Scrap	8.00 to 9.00
Pipe Scrap	5.00 to 5.50

Coke.—Stocks in this city are not large, but several shipments by sea have arrived lately, and more are on the way from Australia. Prices are practically unchanged.

The report is current that efforts are being made for a renewal of the contract by which the American Can Com-

pany will continue to supply the California Fruit Canners' Association with fruit and vegetable cans. This large contract, which expires December 31, was made in 1902 by F. A. Assman, who was then president of the Can Company.

Bids for furnishing and delivering four hoisting engines, three locomotives and two boilers will be received up to November 18, by S. W. Roessler, Lieut.-Col. United States Engineers, Portland, Ore.

Cleveland.

CLEVELAND, OHIO, November 12, 1907.

Iron Ore.—The movement of Ore from the upper lake ports has been quite heavy so far this month, but will show a decided falling off by the end of this week. The very heavy shipments during October enabled shippers to get well up on their contracts. As a result some shippers already have their contracts well cleaned up, and others will ship little, if any, Ore after November 20. Not much will be moved in December, and the close of the season this year will be very different from the last few weeks of navigation last year when there was a great rush to get down as much Ore as possible before the freighters were tied up. Furnace interests are well supplied with Ore, and some who had expected to need a little more of certain grades have notified shippers that they will need no more than their contracts call for. This falling off in the demand, due to present business conditions, has also had the effect of hurrying the shipping season to a close. No unsold Ore will be brought down and piled on the docks. A large part of the Ore that is being received at present is being piled on the docks at Lake Erie ports, and Ore carriers are being badly delayed at this end of the route, the work of unloading cargoes being slow because of the scarcity of dock space. Cargoes of all kinds are scarce at upper lake ports, and many of the smaller boats are going out of commission. Most of the barges of the Pittsburgh Steamship Company will go out of commission this week. There is no inquiry for next year's Ore. This year's prices continue as follows at Lake Erie docks, per gross ton: Old Range Bessemer, $5; Mesaba Bessemer, $4.75; Old Range Non-Bessemer, $4.25; Mesaba Non-Bessemer, $4; Siliceous Bessemer, $2.75; Siliceous Non-Bessemer, $2.35 to $2.60.

Pig Iron.—The market continues lifeless. There has been practically no inquiry for spot Foundry Iron, and the temporary business depression, due to the financial situation, has caused quite an increase in withhold orders. There has been a heavy falling off in the demand for castings, so that the melt of the foundries has diminished, and they are accumulating stock piles. Up to the present time furnaces in this territory have had no trouble in marketing their Iron, the surplus due to withhold orders being sold for prompt shipment. With no demand for spot Iron and an increase in withhold orders, however, some of these furnaces will soon accumulate stocks. The furnace interests are not disposed to pile much Iron, and if the present conditions continue some of the furnaces in this territory may go out of blast within a few weeks. None of the furnacemen, however, have decided as yet to close down their furnaces this month. The withhold orders are about the same on Bessemer and Malleable as on Foundry Iron. Owing to the absence of a demand prices are merely nominal. The only sale reported during the week was a small tonnage of No. 2 Foundry at $20, Toledo, for prompt shipment. There are no inquiries for Foundry Iron for next year. A local interest that has changed its western Pennsylvania furnace from Foundry to Bessemer Iron is holding the price at $22 for the balance of the year, but reports no sales. Quotations for the balance of the year, f.o.b. Cleveland, are as follows:

Bessemer	$21.90
Northern Foundry, No. 1	21.00
Northern Foundry, No. 2	20.50
Northern Foundry, No. 3	20.00
Southern Foundry, No. 2	$21.35 to 21.85
Gray Forge	20.40

Coke.—The market is quiet, there being no demand for either Foundry or Furnace grades. Owing to the shutting down of blast furnaces some surplus Furnace Coke has been thrown on the market, and it is offered at $2.75, at oven. There is no further inquiry for Foundry Coke for the first half of next year. We quote Connellsville Furnace Coke at $2.75 to $3, at oven, for balance of the year, and 72-hr. Foundry Coke at $3.25 to $3.50, at oven, for the balance of this year and the first half of next year.

Finished Iron and Steel.—The effect of the financial stringency has been felt more seriously by local industries the past few days than in the previous week, and this has caused a further falling off in the demand for Finished Material. New orders are scarce and only for a small tonnage, a carload or less for immediate requirements. The falling off in current orders of the larger mills has been as much as 75 per cent. in the past month. With the cancellation of old orders and the absence of new ones local industrial plants making Iron and Steel products have adopted radical policies of retrenchment and have either laid off much of their help or reduced their working hours. Plants that have enough work on hand to keep them running for some time have been forced to adopt the same policy because of the financial stringency, being unable to secure funds to keep running at full capacity. Nearly all the plants adopted the policy last week of paying their workmen largely in clearing house certificates. With a relief in the money stringency a considerable improvement in the demand is expected, there being many consumers who need material but who are unable to buy it at the present time. Until conditions improve the mills will make little effort to get new business. With the exception of Black Sheets and Light Plates, prices are being held firmly. It is the opinion that price cutting would not increase the present demand and would have a bad effect on future business. New business in Iron Bars is light, but local mills have enough orders on hand to keep them running a few days. Local mills quote Iron Bars at 1.60c., Cleveland, outside mills asking the same price, Pittsburgh. We quote Steel Bars at 1.70c., Cleveland, for car lots, with half extras. There is practically no inquiry for Plates. A boat contract closed the past week will require about 500 tons of Plates and Shapes. We quote Plates, ¼ in. and heavier, carload lots, 1.80c., base, Cleveland. Good deliveries can be secured in Sheets, but there is very little demand. We quote Beams and Channels at 1.80c., base, Cleveland. A few sales of Forging Billets are reported in small lots at $31, at mill. The financial situation has affected the jobbers' trade, and warehouse business is very light. There is no change in warehouse prices. We quote steel Bars out of stock at 1.90c. to 1.95c., and Iron Bars at 1.95c. to 2c. Warehouse prices on Sheets are as follows: Blue Annealed, No. 10, 2.30c.; No. 28, One Pass Cold Rolled, 3.05c.; No. 28, Galvanized, 4.05c. Beams and Channels out of stock are 2.10c. to 2.15c, base. Warehouse prices on Boiler Tubes, 2¾ to 5 in., are 64 per cent. discount, and on Black Merchant Iron Pipe, base sizes, 67 per cent. discount.

Old Material.—The market is stagnant. With a limited tonnage of orders on their books and enough Scrap to supply their immediate needs, the mills show no interest in the market, and refuse to make any offer for Old Material offered them by dealers. Prices are inclined to further weakness, but with the total absence of a demand quotations for the most part are merely nominal. Better prices are not hoped for until a fair demand is created, but dealers think the bottom has about been reached. The railroad offerings this week include a list of about 6000 tons to be sold by the Baltimore & Ohio. Dealers' prices to the trade, per gross ton, f.o.b. Cleveland, are as follows:

Old Steel Rails	$14.50 to $15.00
Old Iron Rails	21.50 to 22.00
Steel Car Axles	19.00 to 20.00
Old Car Wheels	19.00 to 20.00
Relaying Rails, 50 lb. and over	27.50 to 28.00
Relaying Rails, under 50 lb.	30.00 to 31.00
Heavy Melting Steel	14.50 to 15.00
Railroad Malleable	15.00 to 16.00
Agricultural Malleable	14.00 to 14.50
Light Bundled Sheet Scrap	10.00 to 11.00

The following quotations are per net ton, f.o.b. Cleveland:

Iron Car Axles	$22.00 to $22.50
Cast Borings	9.50 to 10.00
Iron and Steel Turnings and Drillings	10.00 to 10.50
Steel Axle Turnings	11.50 to 12.00
No. 1 Busheling	12.50 to 13.00
No. 1 Railroad Wrought	15.00 to 15.50
No. 1 Cast	15.00 to 15.50
Stove Plate	12.50 to 13.00
Bundled Tin Scrap	10.00

Cincinnati.

CINCINNATI, OHIO, November 13, 1907.—(*By Telegraph.*)

Conditions closely approximating the chaotic, mark the present course of the Iron markets in this section, and it is extremely difficult to secure an intelligent and reasonable quotation for the simple reason that comparatively nothing is doing. The melt is off 50 to 75 per cent. in many of the larger foundries, and some few are practically idle in the finished lines. While there is no buying, prices are maintained at about the same level. Reports from the Coke districts indicate a closing down of operations, curtailing production to correspond with decreased consumption. Some of the Coke producers are seriously hampered for currency for payrolls, the peculiar character of the labor employed making currency absolutely necessary which banks are unable or unwilling to furnish at the present time. Local Pig Iron people are watching with considerable interest the movements of the stove foundrymen who are in session at Columbus to-day. Persistent rumors hinting at a closing down of the largest furnaces in the Central West are given credence by some of the best posted agents in this territory. Coupled with the general inertia in the buying field is the additional burden of heavy cancellations, and this last characteristic of the consumer is the one which just now is giving the sales agent the most concern. The recent action of foundrymen and other manufacturers in this section in

organizing under the name of the Iron Buyers' Association is not regarded very seriously by the agents and furnacemen as far as can be ascertained, for the reason that they deny the justice of the main charges made relating to deliveries on contracts. One of the chief complaints of the foundrymen in the Cincinnati District is the apparent discrimination of the railroads in favor of the Southern foundrymen. In a time like the present, when there is a money stringency and cancellations are coming in from the machine tool and other manufacturing concerns, it is reasoned that ordinary troubles are magnified and enlarged to assume the shape of formidable grievances, and it is felt that when the atmosphere becomes a little clearer there will be a diminution of complaints accordingly.

Pig Iron.—An appearance of activity in many of the larger sales agencies might decieve the uninitiated, but to the close observer it is apparent that heads of departments and clerks are largely occupied with correspondence, of which the burden is negotiating regarding the cancellation of unfilled contracts. Needing Iron only for present needs, and those needs abbreviated, there are naturally a large number of consumers who, in the face of the existing financial situation, want to repudiate contracts made in a time of inflated values and unusual prosperity. There is absolutely no inquiry for the first quarter, although a few feelers have reached agents for Iron for December and January delivery, hoping evidently for something upon which to base their contracts with various consumers which expire on the last of the year. While there have been some sales of Southern No. 2 Soft during the week at a figure approximating $16, and rumors are flying thick that that figure and perhaps a trifle lower on a large tonnage can be done on spot business, the larger furnaces in this field who are well sold up on contracts are maintaining a price of $16.50, Birmingham. Practically the same conditions exist in the Hanging Rock District, where some well known producers still maintain a price of $20 and higher on No. 2, yet a prominent furnace, which has been a factor in former years when prices were declining, is said to be selling on a basis of $18.50 at furnace. About the only sales of any consequence that can be traced during the week are one of a moderately good sized tonnage of No. 2 Soft Southern to a Pipe company and one smaller to a Columbus melter. The entire absence of consignments of Iron and the independent attitude of the railroads are features of the present times, and the conditions which confront selling agents as between the consumer and the furnace naturally suggest resale Iron, and it is therefore believed that practically all of what little Iron is now selling for immediate delivery is resale. As nearly as can be ascertained from careful investigation and comparison of results and sales, prices for this week may be quoted as follows, the freight rate from Birmingham, $3.25, and from the Hanging Rock District, $1.20, being included:

Southern Coke, No. 1	$20.25 to $20.75
Southern Coke, No. 2	19.75 to 20.25
Southern Coke, No. 3	18.75 to 19.25
Southern Coke, No. 4	17.75 to 18.25
Southern Coke, No. 1 Soft	20.25 to 20.75
Southern Coke, No. 2 Soft	19.75 to 20.25
Southern Coke, Gray Forge	17.00 to 17.50
Southern Coke, Mottled	16.50 to 17.00
Ohio Silvery, 8 per cent. Silicon	28.20 to 29.20
Lake Superior Coke, No. 1	20.20 to 20.70
Lake Superior Coke, No. 2	19.70 to 20.20
Lake Superior Coke, No. 3	19.20 to 19.70
Car Wheel Irons.	
Standard Southern Wheels	$29.25 to $29.75
Lake Superior Car Wheels	27.70 to 28.00

Coke.—The Coke market is dull, as might be expected from the decreased melt in foundries, and no immediate relief is in sight. Reports from the various fields tell of shutting down of operations and the coming week is expected to make a record in this line. There is now little heard of car shortage except in the New River field. The best grades of Foundry Coke are still held at $3.25 to $3.50 and Furnace at $2.25 to $2.75, at oven.

Finished Iron and Steel.—The Finished lines seem to have been caught in the prevailing fever and a nice buying movement, which lasted until a week or so ago, has degenerated into a well defined slump. There is no change in prices, and none is anticipated for a time. Sheets, which a few weeks ago could not be delivered under 24 to 26 weeks, are now good for four to five weeks, and Bars can be had for practically immediate delivery. Structural Shapes continue in fair demand. Local store keepers who contemplated extensions and enlargements have for the present abandoned them. Dealers quote, f.o.b. Cincinnati, as follows: Iron Bars, carload lots, 1.80c., with half extras; small lots from store, 1.90c., base, full extras; Steel Bars, carload lots, 1.75c., base, half extras; small lots from store, 1.90c., base, full extras; Base Angles, carload lots, 1.75c.; small lots from store, 2.10c.; Beams, Channels and Structural Angles, 1.85c., base; small lots from store, 2.10c.; Plates, ¼-in. and heavier, carload lots, 1.95c.; small lots from store, 2.20c.; Sheets, No. 16, carload lots, 2.20c.; small lots from store, 2.50c.; No. 14, carload lots, 2.10c.; small lots from store, 2.40c.; Steel Tire, 4-in. or heavier, carload lots, 1.95c., base; Plates, 3-16 and No. 8, carload lots, 2c.; small lots from store, 2.25c.; Sheets, No. 10, 2c., carload lots; 2.30c. from store; Sheets, No. 12, 2.05c., carload lots; 2.40c. from store; Light Sheets, Black, No. 28, carload lots, 2.75c.; Galvanized, No. 28, 3.90c.

Old Material.—In the line of Scrap, dealers report no movement, and the indications are for still lower prices. The following prices are given as the best obtainable in a market in which there is nothing doing to establish a fair selling figure:

No. 1 Railroad Wrought, net ton	$13.00 to $14.00
Cast Borings, net ton	6.00 to 6.50
Steel Turnings, net ton	6.50 to 7.50
No. 1 Cast Scrap, net ton	14.00 to 14.50
Burnt Cast and Wrought, net ton	8.00 to 8.50
Old Iron Axles, net ton	19.00 to 20.00
Old Iron Rails, gross ton	16.50 to 17.00
Old Steel Rails, long, gross ton	13.50 to 14.50
Relaying Rails, 56 lb. and up, gross ton	25.50 to 26.00
Old Car Wheels, gross ton	19.50 to 20.00
Mining Car Wheels, gross ton	10.50 to 11.50
Low Phosphorus Scrap, gross ton	16.00 to 16.50

Metal Market.

NEW YORK, November 13, 1907.

Pig Tin.—Business has been exceedingly dull, with transactions amounting to probably less than 150 tons, almost wholly made up of 5-ton lots to fill immediate requirements. The difficulty in securing prompt remittances from out of town firms and the disturbed financial atmosphere are contributory causes, but business is slackening down and the decline in the price would probably have extended further had it not been for the fact that shipments from the Far East are small. The low price of the week was reached on November 7, when Tin was sold at 29.75c. A sharp advance on the following day was ascribed to the buying of a leading London operator and the small arrivals there. Price changes during the week have been as follows:

	Cents.
November 6	32.50 to 32.60
November 7	29.75 to 29.80
November 8	30.50 to 30.60
November 11	31.45 to 31.50
November 12	31.50 to 31.55
November 13	30.75

Arrivals so far this month have been exceedingly small, aggregating less than 800 tons, but in spite of this Tin is going into store. The afloats are small, amounting to 720 tons. The London market closes weak to-day, at £138 10s. for spot, and £139 15s. for futures. Part of this decline in London is ascribed to the effects of the late panic in New York, which are beginning to make themselves manifest in London commodity markets.

Copper.—Business is very irregular, and quotations are largely nominal, due to the absence of inquiry for large lots. At all events Copper is easier than a week ago, and can be bought at 14.25c. to 15c. for Lake, 13.50c. to 14c. for Electrolytic, and 13c. to 14c. for Casting Grades. Electrolytic for export has been sold at 13.25c., c.i.f. New York. The premium on Lake is considerable, as the Lake producers refuse to cut their price. The boom in the Copper market a fortnight ago was considered ill advised at that time, although it did succeed in driving in some business. The facts of the case are that the underlying conditions are considerably sounder now than a month ago, due to the sale of considerable surplus in Europe and the shortness of the time before the curtailing of the Butte production will make itself felt. On the other hand it is almost impossible to tell whether a general slowing down of business will result in such reduced prices for fuel, labor and other commodities going to make up the cost of Copper that selling prices will fall below the former low level of 12c., but this is deemed improbable. However, it is practically assured that should such a low price be again reached stocks of Copper would be quickly purchased. There continues to be a fair business in small lots which command relatively high prices. In some lines of finished product the demand has been exceptionally good, notably Copper Sheets, the prices of which, however, have been shaded below the official 20c. base. Complete returns for October exports of Copper are now at hand, showing that the total outgo was 29,161 tons, which is a new high record. The exports so far this month have been heavy, amounting to 12,980 tons. The London market is weak to-day, closing at £58 15s. for spot, and £58 15s. for futures, with Best Selected held at £64. L. Vogelstein & Co. figure the German consumption of foreign Copper for the months January to September, 1907, inclusive, as 87,480 tons, against a consumption during the same period in 1906 of 91,340 tons.

Pig Lead.—Prices are easy, and Lead can be obtained in St. Louis at 4.35c., equivalent to 4.50c. in New York, for shipment. Spot Lead in New York, however, cannot be obtained at under 4.55c., and probably 4.60c. would be asked in some quarters. The American Smelting & Refining Company's price and terms continue unchanged.

Spelter.—There has been a marked falling off in the demand, and cash buyers have been able to secure the metal at relatively low figures, equivalent to 5c. St. Louis, and

from 5.15c. to 5.25c. New York. Premiums, however, are demanded for spot.

Antimony.—Prices are again lower, Hallett's being held at 10c., and Cookson's at 11c.

Nickel.—Prices are unchanged, ton lots being held at 45c., and smaller quantities at 50c. to 60c.

Ferroalloys.—A further weakness has appeared in the price of Ferromanganese, which is now held at $52, Pittsburgh, and $50, Baltimore. There is some irregularity in the price of 50 per cent. Ferrosilicon, but this is relatively strong at $98 for futures, and $100 for spot.

Tin Plate.—The situation is unchanged, and prices are firm, at $3.90, f.o.b. Pittsburgh, and $4.09, f.o.b. New York. Tin Plates in Swansea are now 13s. 4½d., a decline of 1½d. since last week.

Old Metals.—The demand for Old Metals has fallen off, and the following dealers' selling prices are lower than last week:

	Cents.
Copper, Heavy Cut and Crucible	12.50 to 13.50
Copper, Heavy and Wire	12.00 to 13.00
Copper, Light and Bottoms	11.50 to 12.00
Brass, Heavy	9.50 to 10.50
Brass, Light	8.00 to 8.50
Heavy Machine Composition	12.00 to 12.50
Clean Brass Turnings	8.50 to 9.00
Composition Turnings	10.00 to 11.00
Lead, Heavy	4.37½
Tea Lead	4.00
Zinc Scrap	4.25

New York.

NEW YORK, November 13, 1907.

Pig Iron.—The market has been very quiet, both buyers and sellers assuming a very conservative attitude. Prices are nominal, the market not having been seriously tested. We quote, nominally, for Northern Iron, tidewater, $20 to $20.50 for No. 1 Foundry; $18.75 to $19.25 for No. 2 Foundry, and $18 to $18.25 for No. 2 Plain. Alabama Irons are quoted, nominally, $21 to $21.50 for No. 1 Foundry, and $20.50 to $21 for No. 2 Foundry.

Structural Material.—So far as the work under way at the American Bridge Company's plants is concerned, there is no cessation, and in some cases deliveries are being urged forward. The October output of these plants was 66,700 tons, the greatest record in their history. The amount of work booked in October was only 23,000 tons, however, and the estimate is that about 27,000 tons was taken by other fabricating committees. In the same month a total of 50,000 tons of prospective work on which bids had been asked was laid aside by the projectors. Some of it may be taken up later, but the time is indefinite. The Milliken Brothers' receivers have taken the contract for the Structural Steel for the new Masonic Temple at Twenty-fourth street and Sixth avenue, New York. The building will have 18 stories and about 2500 tons of Steel will be required. The pier work recently figured on for Brooklyn has not been awarded as yet, and its prosecution is uncertain. The construction of the Chelsea piers let some months ago will not be proceeded with for the present. Some further bridge work has recently been let by the New Haven Road—a total of about 1500 tons. Most of the large office buildings in New York will be finished this week so far as the Steel work is concerned, and there is little new work ahead, for the forces that have been engaged on these contracts. We continue to quote tidewater deliveries, mill shipments, as follows: Beams, Channels, Angles and Zees, 1.86c.; Tees, 1.91c. On Beams, 18 to 24 in., and Angles over 6 in., the extra is 0.10c. Sales out of stock, of material cut to length, are made at 2¼c. to 2½c.

Bars.—The demand is limited to the most pressing requirements, and consequently the volume of business is small. Mills continue to quote both Bar Iron and Steel Bars on the basis of 1.60c., Pittsburgh, or 1.76c., tidewater, but some of the Bar Iron mills are shading this price about $1 per ton.

Plates.—The local market is exceedingly quiet. Prices are nevertheless maintained as follows for tidewater delivery: Sheared Tank Plates, 1.86c. to 1.96c.; Flange Plates, 1.96c. to 2.06c.; Marine Plates, 2.26c. to 2.36c.; Fire Box Plates, 2.75c. to 3.50c., according to specifications.

Cast Iron Pipe.—No business of importance has transpired since our last report. Inquiries are few. Carload lots of 6-in. are quoted at $31.50 to $32 per net ton, tidewater, but it is quite likely that attractive orders could be placed at some concession.

Old Material.—Experienced dealers report this market in the worst condition for many years; in fact, some of them say that they have never known anything like it. It is exceedingly difficult to transact business because of monetary conditions. Heavy offerings are being made by railroads, on which low prices are being accepted, and different grades of material have shown no relation to one another in the results realized. As far as prices are concerned, values appear to have dropped from $1 to $5 per ton within the week. The Eastern market is not only affected by financial conditions but also by the demoralized state of Western markets. Some dealers have contracts for Steel Scrap to fill which were taken at recently prevailing prices, but the best offer made by them for delivery at eastern Pennsylvania mills is $12, and they express themselves as willing to buy very little even at that low rate, first on account of the scarcity of money, and second because of the slowness of collection from the mills. Neither steel plants nor rolling mills are buying more than very small quantities and are not inclined to purchase for delivery further than 30 days hence at any price. Under the circumstances it is difficult to quote, the following range of prices being given as the closest approximation possible to make at the present time, per gross ton, New York City:

Old Girder and T Rails for melting	$10.00 to $10.25
Heavy Melting Steel Scrap	10.00 to 10.25
Old Steel Rails, rerolling lengths	12.00 to 12.50
Relaying Rails	20.00 to 21.00
Old Iron Rails	15.00 to 15.50
Standard Hammered Car Axles	21.00 to 21.50
Old Steel Car Axles	15.50 to 16.00
No. 1 Railroad Wrought	12.00 to 12.50
Iron Track Scrap	10.50 to 11.00
No. 1 Yard Wrought, long	10.50 to 11.00
No. 1 Yard Wrought, short	10.00 to 10.50
Light Iron	5.00 to 6.00
Cast Borings	6.00 to 6.50
Wrought Turnings	8.00 to 8.50
Wrought Pipe	9.00 to 9.50
Old Car Wheels	18.50 to 19.00
No. 1 Heavy Cast, broken up	13.50 to 14.00
Stove Plate	12.00 to 12.50
Grate Bars	10.00 to 10.50
Malleable Cast	12.50 to 13.00

Iron and Industrial Stocks.

NEW YORK, November 16, 1907.

In a general way, the Iron and Steel stocks showed slight fluctuations in the past week, as transactions were limited, owing to the continued financial stringency, but in a few instances there were notable developments. Following the exchange of Tennessee common stock for Steel Corporation 5 per cent. bonds, enormous selling developed in these bonds, the transactions on Friday reaching a par value of $2,185,000, and the price declining to 80, closing on that day, however, at 81⅝, and reaching still higher figures on subsequent days with the diminution in the selling. Tennessee stock, which for a long time had been held with almost unvarying firmness at 135, sold on Thursday morning at 120, and shortly after dropped to 101, selling on the day following at 95. Another interesting development occurred in connection with Steel Foundries preferred, which sold down to 22 on Thursday prior to the announcement by the Board of Directors that a part cash and part scrip dividend had been decided upon, to be ratified by the stockholders. On the same day, immediately after the announcement, the stock sold at 31, rising the next day to 31½ and fluctuating since then from 29 to 30. The range of prices in other prominent stocks from Thursday to Tuesday of this week has been as follows: United States Steel common 23⅞ to 25½, preferred 83½ to 85¾; Car & Foundry common 26 to 27⅛, preferred 80⅛ to 82½; Locomotive common 37½ to 40, ex-dividend, preferred 88½ to 93½; Colorado Fuel 16½ to 17; Pressed Steel common 17 to 18, preferred 68½ to 70; Railway Spring common 25 to 25⅞; Republic common 15 to 17, preferred 57 to 60; Sloss-Sheffield common 36 to 38½; Cast Iron Pipe common 19 to 20, preferred 51 to 53⅝; Can preferred 40. Last transactions up to 1.30 p.m. to-day are reported at the following prices: United States Steel common 24¼, preferred 84½; Car & Foundry common 26, preferred 82½; Locomotive common 38¾, preferred 93; Colorado Fuel 16¼; Pressed Steel common 17¾, preferred 70; Railway Spring common 25⅛; Republic common 16, preferred 60; Sloss-Sheffield common 38¼; Tennessee Coal 101; Cast Iron Pipe common 19; Can common 3½, preferred 40.

The Lake Superior Corporation failed to elect new directors at the adjourned annual meeting held in Jersey City November 5. Supporters of the present administration were enjoined from voting 50,000 shares, of which the transfer was in dispute, and an adjournment was taken to January 11, to await the decision of the New Jersey courts.

A special meeting of the stockholders of the Empire Steel & Iron Company will be held at the principal office of the company, in the office of Brinkerhoff & Fielder, 15 Exchange place, Jersey City, N. J., November 19, 1907, at 11 o'clock in the forenoon, to decrease the capital stock of the corporation, of which there is now issued and outstanding $4,781,400, par value, to $3,754,770, par value, by reducing the common stock (of which there is now issued and outstanding $2,281,400, par value) to $1,254,770, par value, by the surrender by every stockholder of his shares and the issue to him in lieu thereof of a decreased number of shares.

Dividends.—The Niles-Bement-Pond Company has declared the regular quarterly dividend of 1½ per cent. on the preferred stock, payable November 15.

The Pratt & Whitney Company has declared the regular

quarterly dividend of 1½ per cent. on the preferred stock, payable November 15.

The American Radiator Company has declared a quarterly dividend of 1¾ per cent. on the preferred stock, payable November 15, and 1 per cent. on the common stock, payable December 31.

The Sloss-Sheffield Steel & Iron Company has declared a quarterly dividend of 1¼ per cent. on the common stock, payable December 2.

Trade Publications.

Machinery.—Burke Machinery Company, Cleveland, Ohio. Insert section for loose leaf catalogue. Contains matter superseding that of all earlier leaflets dealing with the company's Nos. 1, 2 and 3 milling machines, vertical milling attachments for Nos. 3 and 4 milling machines, index centers, slotting attachments, milling machine and drill press vises, Nos. 0 and 1 sensitive drill presses, Nos. A, B, C and D tapping machines and a coal oil forge. An accompanying circular letter, with reference to another leaflet, describes the straight and reverse knockouts for table feeds of the Nos. 2 and 4 milling machines.

Concrete Mixers.—John L. Kirk, 203 Ferguson Building, Pittsburgh, Pa. Catalogue No. 12 of the concrete mixer made by the T. L. Smith Company, Milwaukee, Wis. Sums the advantages of the Smith mixer and describes its principle of operation in connection with sectional views. Illustrations are given of various portable power driven equipments of the Smith mixer, and dimensions and specifications of capacities of the six different sizes made are given in tabular form. The Smith mixer is also sold by the Contractors Supply & Equipment Company, Old Colony Building, Chicago, and 170 Broadway, New York.

Pneumatic Tools.—Pittsburgh Pneumatic Tool Company, Canton, Ohio. Circular No. 2. Pertains to the Pittsburgh long stroke riveting hammers, chipping hammers, drills, yoke riveters and special devices. Specification tables are included.

Core Machines.—Falls Rivet & Machine Company, Cuyahoga Falls, Ohio. Catalogue. Size, 6¼ x 9½ in.; pages, 54. Deals with the Wadsworth improved core machines and equipment. These machines are capable of making 27 sizes of perfectly round cores, from ⅜ to 7 inches, and also square, hexagon and D shaped cores. Intermediate size dies can be furnished with the machines if required. Cuting-off and coneing machines, "The Falls" friction driven rumbling barrel, air cooled gagger mold and the Wadsworth portable core oven, which was described in *The Iron Age* of April 18, 1907, are also illustrated and described. A partial list of users of the core machines and some testimonial letters are appended.

Emery Wheels and Grinding Machinery.—Safety Emery Wheel Company, Springfield, Ohio. Catalogue. Size, 6 x 9 in.; pages, 184. Gives a comprehensive description and illustration of the company's line of safety, sectional, plain and special corundum, carbondite and emery wheels, and modern, polishing and grinding machinery. Special wheels recommended for Brown & Sharpe, Landis and other universal grinders are illustrated by dimensioned line drawings, and the company's numbers and code words for them are given. Several pages are devoted to safety collars, which are loaned free to users of these wheels. The line of grinding machinery includes various types of tool grinders, Champion grinders, bench grinders, cushion bearing grinders, swing frame grinders, plow grinders, &c.

Metal Sawing Machine.—Quincy, Manchester, Sargent Company, West Street Building, New York City. Loose sheets for insertion in catalogue. Concerns the 1M metal cut-off saw, which is particularly adapted for use in machine shops and other manufacturing establishments that have a large amount of squares and rounds to cut.

Electric Controllers.—Cutler-Hammer Mfg. Company, Milwaukee, Wis. Navy Bulletin No. 22. Particularly compiled for those selling electric motors or motor driven machinery to the Navy Department. Contains descriptions, illustrations, dimension diagrams and shipping weights of starting panels, speed regulating panels, machine tool controllers, resistances, circuit breaker panels, &c. Apparatus acceptable for use in navy yards is not always acceptable for use on shipboard. How to select the proper piece of apparatus in each case is fully explained, and in addition to numerous illustrations of electric controlling appliances conforming to Bureau of Construction and Repair and Bureau of Equipment specifications, the booklet includes several views of battle ships equipped with Cutler-Hammer control.

Gas and Gasoline Engines.—Carlin Machinery Supply Company, Allegheny, Pa. Bulletin No. 1. Describes the New Model gas and gasoline engine No. 1 manufactured by the National Engineering Company, Saginaw, W. S., Mich., and also refers to the Michigan engines, made by the same manufacturer. The latter are built in three sizes, of 3½, 6 and 10 hp. respectively. The New Model No. 1 engine is of four-cycle horizontal type of 2 hp. capacity.

Concrete Mixer.—Chicago Concrete Machinery Company, 20 South Canal street, Chicago, Ill. Folder. Devoted to the Chicago concrete mixer, which is claimed to be efficient, simple and durable. These mixers are made in four sizes, having mixing capacities of 4, 8, 14 and 25 cu. yd. per hour respectively. An accompanying circular letter calls attention to the advantageous features.

Concrete Water-Proof.—Pittsburgh Concrete Water-Proof Company, 709 House Building, Pittsburgh, Pa. Leaflet. Pertains to concrete water-proof, a material applied with an ordinary paint brush to brick and cement to prevent wet and damp walls. It is claimed to hold the original color of brick and concrete, and not to stain or discolor or catch dust and dirt.

Refrigerating Machines.—Bernard Gloekler Company, Pittsburgh, Pa. Catalogue. Size, 5 x 8 in.; pages, 31. Gives a general idea of the company's refrigerating machines and of mechanical refrigeration as applied to abattoirs, packing houses, dairies, ice cream factories, hotels, restaurants, residences, &c. Double, duplex and single cylinder compressors connected with engines and electric motors, and portable refrigerating machines are shown. Ammonia compressors, meat market specialties, cold storage hardware and appliances for the abattoir and market are also dealt with.

Safety Water Gauge.—Northern Specialty Company, 77 Columbia street, Utica, N. Y. Catalogue No. 3. Describes and illustrates the Northern self-closing safety water gauge, as now manufactured in a form containing improvements on the one described in *The Iron Age* February 14, 1907. The chief features are simplicity of construction, positive instantaneous closing feature and absolute safety in manipulating. A new folder, entitled "Ten Reasons Why," deals with the need of safeguarding those who handle a boiler water gauge.

Grinding Wheels and Machinery.—Norton Company, Worcester, Mass. Catalogue. Size, 6 x 9 in.; pages, 146. Contains a price-list with illustrations of forms and sizes of grinding wheels made for all makes of grinding machines. These wheels are made of alundum and by the vitrified, elastic and silicate, or semi-vitrified processes. Descriptions of the advantages of each in its particular field are given. Alundum bricks and rub stones are also referred to, and other special sharpening stones. The last part of the catalogue gives specifications of the company's line of bench and floor grinders.

Cylindrical Grinders.—Norton Grinding Company, Worcester, Mass. Catalogue N-7. Size, 6 x 9 in.; pages, 63. Covers the Norton line of plain cylindrical grinders for straight and taper work that revolves upon two dead centers. A complete description of the constructional features is followed by specifications and illustrations of the various types and sizes, which range in working capacity from 6 x 32 in. to 18 x 168 in. They are furnished in overhead, belted, electric and self-contained electric driven forms. The last few pages of the catalogue show typical work done on these machines.

Mechanical Draft.—Green Fuel Economizer Company, Matteawan, N. Y. Bulletin No. 108. Deals with mechanical draft apparatus, describing and illustrating the parts and showing line drawings of typical installations.

Steam Superheaters.—The Superheating & Engineering Company, 314 National German American Bank Building, St. Paul, Minn. Pamphlet. Deals with the generation and use of highly superheatd steam in stationary engines and locomotives, treating of its advantages particularly in the saving of fuel. It records a test in which with superheaters in a certain steam plant a saving in steam of 23.5 per cent. and a saving in coal of 20.42 per cent. was effected. The company undertakes the designing, furnishing and installing of superheaters adapted to the special conditions of individual cases.

Electric Motors.—Northern Electrical Mfg. Company, Madison, Wis. Booklet No. 39. Subject, "The Machine Tool and the Motor." Shows a number of modern applications of Northern motors to the driving of lathes, shapers, milling machines, planers, drills, &c.

Electric Rheostats and Line Materials.—General Electric Company, Schenectady, N. Y. Two bulletins. No. 4532 describes recently perfected types SA and SO direct current motor starting rheostats in capacities up to 50 hp. and 550 volts. Type SA is intended for one minute duty in connection with shunt, compound or series wound motors. Type SO is similar, but has in addition a no-voltage release attachment and an overload coil in series with the motor armature. Bulletin No. 4538 completely covers the subject of materials for the catenary system of line construction. A number of new designs of frogs, crossings, hangers, &c., are illustrated.

Pneumatic Tools.—Dayton Pneumatic Tool Company, 435 East First street, Dayton, Ohio. Catalogue. Size 6 x 6 in.; pages 47. Illustrates and describes the Dayton line of pneumatic hammers, drills and appliances, air compressors, &c. Simple construction, low cost of maintenance and great power and speed are claims made for the hammers, which are made in sizes of from 1 to 9 in. stroke. The drills are made in drilling capacities of from ⅜ to 3 in. The Climax air compressors, described in the latter part of the catalogue, are made in single and duplex, steam or belt driven forms, with air cylinders varying from 5 x 5 in. to 14 x 12 in. Useful information is appended.

Bearing Alloys.—Lumen Bearing Company, Buffalo, N. Y. Catalogue. Size 6 x 9 in. Presents a comprehensive statement regarding the standard alloys manufactured, the conditions under which they work most advantageously, and their limitations as indicated by experience. These include the following brands: Lumen, Electric, Plumbic, Buffalo, Standard, Special, Alpha Manganese, Aluminum, Yankee, Lotus and Ideal. The company also makes aluminum castings for all purposes.

Pneumatic Hammers.—Ingersoll-Rand Company, 11 Broadway, New York. Bulletin No. 2010. Size 6 x 9 in.; pages 24. Describes in detail the construction and operation of the crown pneumatic hammers, which are of a new and simple design. They are claimed to strike a harder, quicker blow than any other, with 20 to 30 per cent. less air, and to be subject to but slight cost for repairs. They are made in five sizes for chipping, caulking, scaling and flue-beading, &c., and in four sizes long stroke for driving rivets from the smallest up to 1⅝ in. in diameter. The bulletin also gives an interesting illustration of a displacement air meter, by which performances of these tools have been tested.

Portable Crane and Hoist.—D. Round & Son, Cleveland, Ohio. Circular. Refers briefly to the simplex portable crane and hoist, giving table of sizes, dimensions, capacities and prices.

Electrical Equipment.—Westinghouse Electric & Mfg. Company, Pittsburgh, Pa. Catalogue. Industrial series No. 13,101. Gives an exhaustive illustrated description of the electrical equipment at the Hornell shops of the Erie Railroad.

Water and Air Heating.—Green Fuel Economizer Company, Matteawan, N. Y. Booklet. Contains a reprint of an article by C. Eberle of Munich on "The Influence of Boiling by Steam on the Boiler Plants of Breweries." It shows that the highest economy is reached only when both the exhaust steam from the different machines about the brewery and the waste gases from the boilers are utilized for producing hot water, and discusses the use of warm or cold and moistened air for promoting germination, and the use of hot dry air in the malt kiln. By utilizing blowers to move the air, it is claimed much quicker and better results may be obtained than by methods relying upon natural draft.

Electrical Supplies.—Julius Andrae & Sons Company, Milwaukee, Wis. Three catalogues. No. 24, 6 x 9 in. in size, containing 165 pages, is on the subject of telephones, and deals with switchboards, telephone accessories and construction materials. Catalogue No. 22, same size, 46 pages, deals with gas and gasoline engine ignition apparatus, including batteries, spark plugs, spark coils, timers, dynamos, magnetos, &c. Catalogue No. 36 is a novelty catalogue showing electric toys and small goods, such as motors, lights, bells, &c., operable on battery currents.

Plant Economy.—Bristol Company, Waterbury, Conn. Bulletin on above subject by H. P. Dennis. Discusses the most efficient manner of operating steam boilers and particularly calls attention to the usefulness of recording pyrometers and thermometers for keeping watch of furnace and other temperatures.

Storage Batteries.—General Storage Battery Company, 42 Broadway, New York. Bulletin No. 8. Subject, "A Storage Battery in a Large Steel Works." Describes in considerable technical detail the installation of Bijur high duty storage batteries at the Cambria Steel Company's works in Johnstown, Pa.

Forgings.—Anderson Forge & Machine Company, Detroit, Mich. Booklet. Deals with drop forgings, steam hammer forgings, finished crank shafts, automobile tools and cold chisels. A particularly interesting part refers to vanadium steel and the various grades of this alloy steel from which forgings are made, and defines the particular services to which they are adapted. The ability of vanadium steel to resist vibration makes it particularly suitable for engines, automobiles and other machinery subjected to repeated strains.

Structural Work and Manufacturing.—Minneapolis Steel & Machinery Company, Minneapolis, Minn. Booklet. Intended to afford some idea of the scope of the company's operations. The structural department handles architectural and structural iron work; the bridge department, railway and highway bridges; the elevator department, steel grain elevators, steel storage tanks, steel water towers and standpipes, and the mechanical department, Twin City Corliss engines and Munzell gas engine and gas producer power plants, and flour mill, elevator and power connections and appliances.

Gear and Milling Cutters.—Union Twist Drill Company, Athol, Mass. Catalogue D. Size 4¾ x 7¼ in.; pages 157. Compiled as a book of information on the subject of gear and milling machine cutters and similar tools. Information is given with respect to spaces of teeth, sizes, cutting of gear wheels, suggestions for use in ordering form cutters; as a whole the book is intended to be a help in general use. Illustrations are freely used, both half-tones, perspectives and line drawings, the latter to show contours and sections.

Wire Working Machinery.—Turner, Vaughn & Taylor Company, Cuyahoga Falls, Ohio. Loose leaf circulars. Contain illustrations and descriptions of wire working machinery and equipment, including wire and rod drawing frames of wood or iron and steel, galvanizing and tinning furnaces and frames, muffles, bakers, battering furnaces, trucks and complete cleaning house outfits. Other lines covered are chain making machinery, including link winders and cutters, power hammers, foot power hammers and furnaces; sewer pipe and tile presses, and other equipment, including dry pan, wet pan, combination mills, and all general tools necessary for the operation of a complete sewer pipe, fireproofing or drain tile factory, and specialties in the shape of rubber washing machinery, foundry core machines and general power transmission.

Steam and Water Regulating Devices.—Locke Regulator Company, Salem, Mass. Catalogue M. Size 6 x 9 in.; pages 56. Covers all the goods manufactured by this company with the exception of the Locke engine stop, which is illustrated in another catalogue. This catalogue contains illustrated descriptions of damper regulators, pressure regulators, reducing valves, pump governors, and numerous other valves for controlling steam and water pressures.

Smoke Preventers.—Pittsburgh Automatic Smoke Preventer Company, 1105 Keystone Building, Fourth avenue, Pittsburgh, Pa. Pamphlet. Discusses the merits of the improved Western smoke preventer and also contains testimonial letters.

Nut Locks.—Keystone Nut Lock Mfg. Company, 1208 Comonwealth Building, Pittsburgh, Pa. Folder. Describes the principles and use of the Smith nut lock.

Gas Engines and Producers.—J. Thompson & Sons Mfg. Company, Beloit, Wis. Folder. Gives cross sectional views of 160 and 200 hp. double acting tandem automatic cut-off gas engines, and the Burger suction gas producer.

Structural Steel Works.—Interstate Engineering Company, Cleveland, Ohio. Circular No. 101. Refers to structural steel for all purposes.

Steam and Oil Separators.—Hershey Machine & Foundry Company, Manheim, Pa. Booklet. Concerns the Baum steam and oil separators. Live steam separators are made for pressures up to 250 lb., and oil separators for free exhaust or vacuum systems.

Portable Electric Tools.—United States Electrical Tool Company, Cincinnati, Ohio. Catalogue. Size 6 x 9 in.; pages 44. Contains illustrated descriptions and specifications of portable tools for operating on direct current, including hand or breast drills, bench drills and grinders.

Milling Machines.—Waltham Watch Tool Company, Springfield, Mass. Four circulars. Refer respectively to the company's new Van Norman bench milling machines, and the Nos. 0, 1 and 2 Van Norman duplex milling machines.

A Modern Brass Foundry.

There is probably no industry in which copper and its alloys are more extensively used than in the manufacture of electrical apparatus. A model brass foundry is therefore one of the principal needs of a large manufacturer of such apparatus. One of the best arranged and equipped brass foundries in the country is that in the Allis-Chalmers Company's electrical works at Cincinnati, Ohio. This department turns out over 50,000 lb. of castings per month, of a wide variety of sizes and forms, in brass, bronze, aluminum and special alloys. The foundry at present employs about 60 men.

A large proportion of the molds are put up on Tabor machines, which are situated at one end of the foundry, and the molds are carried back and arranged in rows down the length of the floor. The sand tempering and mixing machinery is in the center of the room, as is also the cleaning department, leaving the sides nearest the windows where the best of light is obtained for the molding floors. Where the heaviest work is made an overhead trolley track is provided for handling molds and ladles. The cleaning department is equipped with metal band saws, and all of the other machinery necessary for rough finishing the castings. Since a great part of the castings are small and intricate in form, the number of pounds produced is hardly representative of the amount of work necessary to turn them out. This is especially true of the bench work and floor molding.

Aluminum castings in considerable quantities are made, some weighing over 700 lb., and as large as 12 ft. in diameter. Most of the metal is melted in a battery of four Monarch oil furnaces, which are fired with crude oil. There is no difficulty whatever in melting aluminum or any of the other alloys in furnaces of this type. For special alloys a battery of seven crucible furnaces is provided. Back of the crucible furnaces there is a core oven, which is heated by the waste heat from these furnaces. The core department is also situated back of these furnaces, so that the cores can be placed in the oven as soon as they are finished.

The Machinery Trade.

NEW YORK, November 13, 1907.

The most important developments in the trade the past week were the specifications sent out for a large number of cranes, two inquiries alone aggregating 25 electric traveling cranes. Inquiries for other classes of machinery, especially machine tools, were not very numerous and covered mostly single tools, while orders showed a perceptible falling off. With some houses business since our last report was smaller in volume than for any similar period for some time past. Of course the main factor in the present depression is the money stringency, not only because it is preventing the carrying out of improvements planned and the purchasing of much needed machinery, but because it is causing merchants much difficulty in taking care of what business there is. In this connection the suggestion that the Government pay its bills more promptly is of interest. Machinery houses in this district sell a good deal of machinery to the various departments at Washington, and more prompt payment by the Government would afford some relief to the trade. The way business is being held up by the scarcity of money is illustrated by the experience of a machinery house in this territory, which has about $50,000 worth of prospective orders held up in the purchasing departments of various companies by the managements because of the lack of money.

Machinery men who follow railroads closely aver that, notwithstanding the fact that railroads as a rule are retrenching considerably, there is a good deal of necessary purchasing to be done, which must come before the trade shortly. It is known that the Baltimore & Ohio Railroad has a large list, which was prepared some months ago and most of which covers equipment that is really needed in the company's shops. Other railroads are in a similar position, and it will not be long, it is thought, before some inquiries will develop from these sources.

Judging from inquiries in the market and purchases that are being made, the Japanese export houses have a large number of orders to fill for the Imperial Government. A number of Japanese naval officials who are in this country superintending the construction of war vessels being built for the Japanese Government have been superintending the issuance of inquiries for a varied assortment of machinery, and in some cases when they have decided on purchases the orders have been placed through one or another of the Japanese export firms. It is said in the trade that the requirements cover a large line of equipment, and already some substantial orders have been placed in the trade. It is said that there is more business in the way of machine tools to follow before long.

The Leather Belting Manufacturers' Association will hold its annual meeting at the Fifth Avenue Hotel, November 19, at which time the organization will listen to an address on "The Benefits to Be Derived from Trade Association and the Duties of a Secretary-Commissioner," by Henry Othmer, Chicago, Ill. The convention will be called to order at 2 o'clock in the afternoon, and at 7.30 o'clock a banquet will be served to the members in celebration of the twentieth anniversary of the association.

The House Committee of the Machinery Club, at a meeting held on Wednesday afternoon in the office of the Watson-Stillman Company, awarded the contract for the china for the club's table service and received a communication from the Hudson Companies assuring the committee that its quarters in the Hudson Terminal Building will be ready by May 1. The House Committee will meet hereafter every Saturday afternoon.

Large Inquiry for Traveling Cranes.

Especially large inquiries for electric traveling cranes have recently been received, which include some cranes of 100 tons capacity. The largest of the inquiries is undoubtedly the one sent out by the Youngstown Sheet & Tube Company, Youngstown, Ohio, which has asked for bids on 20 electric cranes, two of which are of 100 tons capacity, for the 300-ton mixers which were recently installed in its plant. The other cranes are to be installed in the company's new tube mills, and, aside from these cranes, it is expected that the company will shortly place orders for four new soaking pits and other equipment. A number of important improvements have recently been made to the plant, which have been referred to from time to time in these columns, including the completion of the building of a new socket shop.

Inquiries are in the trade from the Delaware, Lackawanna & Western Railroad for cranes for its new shops, now in course of construction at Scranton, Pa. Some time ago the company placed orders for its principal power equipment, and it is expected that the inquiries for cranes will be followed by a machine tool list of large proportions. The company wants five cranes, according to its present inquiries, all of small dimensions, the largest being a 15-ft. crane. The company is carrying out in a general way its plans laid down the first of the year for improvements at Scranton, when it was decided to build about half of the shops planned a number of months earlier, and it is probable that next year the plant will be brought up to the size originally intended. The company's plans include the construction of a foundry, 120 x 400 ft.; blacksmith shop, 125 x 300 ft.; storehouse and office, 65 x 325 ft., in addition to a large casting platform. The other shops included in the original plans, which it is stated are to be built later, consist of an erecting, machine, boiler and tank shop, 346 x 582 ft.; paint shop, 90 x 162 ft.; mine repair shop, 80 x 250 ft.; power house, 90 x 160 ft.; scrap platform, 40 x 400 ft.; laboratory, 40 x 70 ft.; roundhouse and other smaller structures. It is said in the trade that the purchasing for these shops will be completed as rapidly as possible, as it is hoped to have at least part of them in operation before the winter is over.

The Intercolonial Railroad of Canada is doing some extensive buying just now for its shops at Moncton, N. B., which are in course of construction. It is understood that the company has a good sized list to fill, and judging from the inquiries in the trade those in charge are trying to place the business in this country. The new shops consist in part of toolroom, brassroom, boltshop, &c., to be contained in a building 44 x 335 ft.; machine shop in two bays, 135 x 355 ft.; smithshop, 75 x 300 ft.; engine shop, 80 x 375 ft.; boiler erecting shop, 50 x 300 ft.; car repair shop, 100 x 360 ft.; passenger car paint shop, 100 x 360 ft.; freight car repair shop, 132 x 360 ft.; planing mill and carpenter shop, 80 x 200 ft. The money for the construction of these shops was set aside by the company some time ago, and it is understood that the machinery purchasing, which is for the entire system, will be closed out within the next few months.

The Pennsylvania Railroad, through the purchasing department, is making few inquiries of interest to the tool and machinery trade at the present time. Invitations to bid upon several coaling plants will soon be extended, and further details of these inquiries will appear next week.

Plans are being prepared by L. G. Smith & Co., 39-41 Cortlandt Street, New York, for a cement plant to be built at Three Forks, Mont., for the Three Forks Portland Cement Company. Only the preliminary plans have been made as yet, and they call for the construction of a plant to produce from 1000 to 1500 bbl. of cement a day. The size of the power plant has not been decided upon, and no contracts are to be awarded on the work until the engineers' plans and preliminary estimates have been passed upon.

The Alpha Portland Cement Company, Easton, Pa., which operates large cement works at Alpha, N. J., and Martin's Creek, Pa., contemplates the construction of a large power plant next spring on the Pennsylvania side of the Delaware River, to supply current to operate the mills. As plans for the new plant have not been prepared, the company is not yet in a position to state the amount of mechanical equipment it will have to buy.

Machine tools, woodworking machinery, &c., also material used in construction of buildings will be required by the Crescent Engineering Company, Newport, Tenn., which is to enlarge its plant and make improvements to facilitate economy in the production of gas and gasoline engines, electric and pumping machinery, &c. The improvements will include the construction of a 300-hp. hydro-electric plant in two units. Small motors, both direct and alternating current, will be installed. The new buildings are to be constructed of concrete, with steel truss roof, and will provide about 25,000 sq. ft. of floor space. The main building of the shops is 70 x 200 ft., with separate foundry; planing room, 50 x 100 ft., with dry kiln building and printing department, 40 x 90 ft.

An indication of the amount of business that is being done in the way of purchasing in this country for the Philippine railroads, which are being constructed by J. G. White & Co., New York, is contained in the fact that about $250,000 worth of material, including locomotives, rolling stock and construction plant equipment of nearly every description, was recently shipped on the steamship Croydon, which sailed from New York for Manila. The material goes to the roads on the islands of Cebu and Panay, construction work on which, as was stated in *The Iron Age* of last week, is well under way.

The compressor department of the Chicago Pneumatic Tool Company, New York, has recently received some nice foreign orders, principally from Canada and South American countries. Orders for compressors from railroads in this country have also been coming in fairly well, recent sales including two to the Oregon Railroad & Navigation Company, one to the Rutland Railroad, one to the Canada Northern Railroad, one to the Boston & Albany Railroad and one to the High Valley Railroad.

Philadelphia Machinery Market.

PHILADELPHIA, PA., November 12, 1907.

There has been a further slowing down of business. Manufacturers and dealers alike find it difficult to interest possible buyers, and there is a very pronounced conservative policy being adopted in almost every direction. The financial situation, while improved in many ways, has evidently held up buying to a very large extent, and it is impossible to get buyers interested, even though the price be made particularly attractive. In some directions, purchasing of new tools or equipment has been cut off entirely, while in other cases only such tools as are absolutely needed are being taken. From present indications, the outlook for new business for the remainder of the year is not favorable, and it is anticipated by some of the trade that the dull period will extend well into next year. Under present conditions it is hard to estimate what will develop after the close of the year. It is unlikely, however, that business will improve until confidence in general conditions is more fully restored.

Sales during the past week have been confined to individual propositions, and mostly to the smaller class of tools, and these for early delivery. Stocks on merchants' floors are increasing rapidly, and in most cases are heavier than desired. Prices, however, are being fairly well maintained, as it has been pretty generally conceded that any reduction in prices would not aid sales, as buyers in most cases would not take hold even if prices were materially lower. Manufacturers in some cases are fairly well occupied, some are still operating to their full capacity, but as a rule tool builders are catching up materially on the old business on their books, and not enough new business to keep them running full is coming in. Curtailments are the order of the day, and while in some instances plants are being operated on reduced working hours, in others, departments which have caught up with the work in hand have suspended operations for the time. The financial stringency has handicapped builders to some extent, and difficulty has been experienced in obtaining sufficient currency to meet the weekly payrolls.

The export demand shows but little change. Inquiries for the usual standard type of tools have been rather light, and no orders of any importance have recently been booked. There is a little better demand for special tools, and some business of this class has been taken, but the aggregate business has been small. Reduced orders are noted by those transacting an established trade abroad in machine and transportation specialties.

The second-hand machinery trade feels the effect of the general depression, the same as the other branches of the trade. Inquiries have been light, and sales have been closely confined to the smaller tools. Some inquiries for heavier tools have been before the trade, but these do not develop into business rapidly.

The boiler and engine trade continues dull and inactive, both makers and dealers in the medium and smaller power equipment finding it difficult to close business, while some of the larger propositions have been held up pending more favorable financial conditions.

Iron and steel casting plants, as a rule, are not busy. The let up in the machinery trade, as well as other industries, has held up considerable work, and foundries find it difficult to get business particularly for future delivery.

Work has been started on an important addition to the plant of the Spreckels Sugar Refining Company at Reed and Meadow streets. It will consist of a three-story brick structure, 57 x 84 ft., and will be used to house a new steam generating plant and for coal storage purposes.

The Dienelt & Eisenhardt Company, Inc., has discontinued its foundry department and has turned the space formerly occupied by the foundry into an erecting shop, which was badly needed in connection with some of its larger work. No additional equipment is required. The crane which served the foundry will be used for work in connection with the erection, while several tools from the otherwise crowded portions of the plant will be moved into the new shop. An order is in hand for a large oil cloth printing machine for export to Scotland, while orders for special machinery, hydraulic jacks, and dead stroke hammers are sufficient to keep the plant well employed for some time. The electrical department is very busy, a good number of orders for motors of various sizes being on the books.

Ballenger & Perrot, architects and engineers, have completed plans and specifications and are now asking for estimates for a two-story addition to the plant of the Esterbrook Steel Pen Mfg. Company, Camden, N. J. The new building will have a frontage of 65 ft. and a depth of 90 ft. and will connect with the present building of the company. The foundations will be laid on concrete piles, owing to the proximity of the building to the Delaware River. The new addition is to be used for manufacturing purposes.

The Baldwin Locomotive Works has booked a hurry order from the Pennsylvania Railroad Company for 25 heavy freight engines, which are to be delivered in the month of December. This is the only order of any size that has been recently booked, most of the business being for small lots or single engines from the smaller railroads and industrial concerns. In October the Baldwin Works built 267 locomotives of various types, of which 257 were shipped. The various departments of the plant are hardly as active as they were, and while there has been no heavy reduction of working forces, there has been some laying off of men in departments which have caught up pretty well with the work in hand.

Chicago Machinery Market.

CHICAGO, ILL., November 12, 1907.

In a large degree business still waits on the easement of money stringency, the effects of which seem now to be not merely local but national. As reflected in the machinery trade, however, the results are not nearly so discouraging as the situation might seem to warrant, for there is, notwithstanding the hampering need of currency and restricted credit, quite a number of small orders being booked. Among the machine tool interests there is a general disposition to regard as improbable an early resumption of notable activity. At the same time, so long as pick-up orders continue to develop, even at the present moderate rate, there is no reason for ultra pessimistic feeling. It is, of course, recognized that if the trade were wholly reliant for support on the larger industries, such as the railroads and the more important manufacturing organizations, it would mean complete stagnation; for practically no business is received from these sources. On the other hand, small plants operating within their own resources are generally able to and are buying what tools and machinery they need. It should be borne in mind that throughout the West, at least, aside from the inconvenience occasioned by the interruption of usual currency accommodations, the effects of reaction elsewhere prevalent have not been severely felt, except by heavy borrowers. In confirmation of this fact a machine tool dealer pointed to a number of orders taken and shipments made during the week, but in nearly every case they were for single tools, one of these, a large drill press, was destined for the Pacific Coast. Other lines of machinery are governed by the same conditions. In electrical equipment sales are principally confined to generators and motors of small units, which is also the case with motive power equipment of other kinds. Pending deals involving large expenditures have been in almost every instance called off for the present at least, and several contracts already negotiated and others all but completed have been cancelled because of refusal by the banks to extend the usual loan accommodations. Payrolls in a number of shops and factories have been lightened by the laying off of hands. This reduction of working forces has been made selectively, with a view to securing higher efficiency by dropping the less competent workers. Forward plans involving machinery equipment are for the time being suspended, since it is impossible to finance such operations even if promoters were willing to proceed.

The Atchison, Topeka & Santa Fé Railroad has plans under way for extensive additions to its San Bernardino, Cal., shops. Among the improvements contemplated is a building 100 x 500 ft., to be added to the machine shop, and the present roundhouse capacity will also be increased. The carrying out of these plans will require the purchase of a large amount of machinery equipment, but in any event there will be no purchases made until well along into next year. In the meantime it is not improbable that the work in hand will be more or less modified by future developments.

F. W. Braun, Los Angeles, Cal., manufacturer and dealer in assay and chemical apparatus and industrial chemicals, is preparing plans for a modern manufacturing plant, which will include a four-story and basement building, 90 x 100 ft.; two-story warehouse, 116 x 150 ft., and a large machinery manufacturing building of saw-tooth construction. The plant will also include additional buildings for an iron and brass foundry and a sheet metal and woodworking department. The plant, as represented by the plans, will involve an expenditure of a large sum of money, and will require for its equipment a large amount of machinery. It is stated that the buildings, which are to be of reinforced concrete construction, are expected to be ready for occupancy within 12 months.

Paul F. Schuster and Warren S. Stearns of Rockford, Ill., have secured franchises for gas plants at Marengo, Ill., Harvard, Ill., Oregon, Ill., and Platteville, Wis. The Platteville Gas Company has been organized at Platteville, Wis., the officers being P. F. Schuster, president, and W. S. Stearns, secretary. Companies will also be incorporated for the purpose of building and operating plants in the other three

towns named within a few weeks. No contracts for construction or machinery equipment have yet been made. Mail concerning either one or all of these enterprises should be addressed to Paul F. Schuster, Rockford, Ill.

The Northern California Power Company, Redding, Cal., which owns and operates a number of large electric light and power plants in that State, has just purchased a tract of 2700 acres near Manton, Cal., upon which it expects to build another new electric power plant. The date for this installation, however, has not yet been decided.

The Allis-Chalmers Company, Milwaukee, Wis., has established a new branch office at Deadwood, S. D., with O. F. Purnell as district manager. Special attention will be given to mining, crushing, pumping, power and electrical machinery.

The Fitchburg Machine Works, Fitchburg, Mass., has appointed Albert J. Ott its representative for the Lo-swing lathe in Illinois, Indiana and Wisconsin. Mr. Ott was formerly for 13 years with the Vonnegat Hardware Company, Indianapolis, Ind.

Cleveland Machinery Market.

CLEVELAND, OHIO, November 12, 1907.

With the local money stringency more acute than a week ago, the machine tool market has shown no improvement during the past week. A few sales of single tools are reported, but business is practically at a standstill because of the inability to secure money to make purchases. For the same reason a large number of additional cancellation orders have come in, many of them from concerns that need the tools soon but do not see how they can pay for them. Some of the largest and soundest industrial companies have passed out word to their purchasing agents to buy nothing except what is absolutely necessary until the financial situation clears up. As must be expected, inquiries for machine tools are fully as scarce as orders. Several new companies that were about to place orders for machinery equipment when the financial storm came on are awaiting developments, being unable to go ahead with their undertakings for the present. Dealers themselves are seriously affected, for the reason that banks are refusing to discount the notes of their customers. With the return of confidence and the easing up of the financial situation dealers expect a fair volume of business which was in sight before the trouble came on. Not much activity is looked for, however, before the first of the year.

Local machine tool builders and manufacturers of other iron and steel products are very seriously affected by the financial situation. They are getting few orders, and it is with difficulty that they secure money to keep their plants running, the inability to make collections making their troubles all the more serious. Local banks are refusing to honor checks for more than $50 in currency. As a result industrial plants began paying off their workmen in Clearing House certificates last week. While with only one or two exceptions no manufacturing plants have shut down entirely, practically all of them have adopted a radical policy of temporary retrenchment and have laid off a portion of their help, the situation giving them an opportunity to weed out their undesirable workmen. Some plants are keeping practically all their men, but are running on shorter hours. The iron foundries seem to be about as seriously affected as any local plants. The demand for castings for early delivery has fallen off to such an extent that it is estimated that fully 40 per cent. of the local molders are temporarily out of employment. Foundries are having trouble in getting work to keep running on partial capacity. Consumers of castings are not anticipating their wants, and in the expectation of getting lower prices next year are not making new contracts.

While the local situation is very unsatisfactory, there is a feeling that with improved conditions in the East the financial stringency will be relieved here in a few days and that affairs will gradually get back to their normal state.

The Walworth Run Foundry Company has commenced the erection of a large addition to its plant on West Twenty-seventh street. The building will be 50 x 170 ft., four stories high. It will be used for the casing ring and register departments of the plant, and will provide additional molding room. The company will soon be in the market for some new equipment. It is expected that the addition will be ready for occupancy about January 1. It will add 50 per cent. to the present capacity. The company reports its sales much larger than a year ago.

The American Steel & Wire Company is erecting an engine house of brick and steel, 130 x 130 ft., at its Central blast furnaces, Cleveland, in which waste gas from its furnaces will be used for power purposes. The Allis-Chalmers Company is installing in the plant four 2000-hp. gas engines, each directly connected with a 1000-kw. alternating current generator. The power from the new plant will be used in operating the blast furnaces, the Newburg works and the new Cuyahoga plant of the American Steel & Wire Company, the latter of which is now in the course of erection.

The Kirk-Latty Mfg. Company, manufacturer of bolts, nuts and juvenile vehicles, reports that its October business was the largest in its history in all its departments. The company is looking for a prosperous year in 1908, and is building some new special machines at its plant, with the view of increasing its output.

The Burger Foundry Company has been incorporated in Akron, Ohio, with a capital stock of $25,000, by Joseph A. Burger, Joseph G. Bachman, C. Brenner, M. M. Kindig and Harry Mitchell. The company will erect a new foundry and will be in the market for foundry equipment in about six weeks.

The McMyler Mfg. Company has just completed a new up to date foundry as an addition to its plant in Warren, Ohio. The building is 100 x 100 ft. It is equipped with an electric traveling crane, a ladle crane and a 2-hp. electric hoist. The power for the plant will be provided by a 200-hp. Westinghouse engine.

The Phœnix Foundry & Machine Company, Ashtabula, Ohio, has been incorporated with a capital stock of $40,000 by Alfred Soedenburg, Carl A. Malguest, C. O. Gudmundson and others.

The Youngstown Roofing Tile Machinery Company, recently organized with a capital stock of $50,000, has elected the following officers: John R. Squire, president; Carroll Thornton, vice-president, and Will B. Jones, secretary and treasurer.

The Accessible Valve Company, Columbus, Ohio, has been incorporated with a capital stock of $5000 to manufacture a special valve for gas and water fittings. The incorporators are Walter Klie, F. D. Wollenwebber and others.

The Standard Appliance Company has been incorporated at Columbus, Ohio, with a capital stock of $100,000, to manufacture appliances for gas and water meters and supplies. The incorporators are Henry F. Gray, F. E. Stevens, E. E. Savage, W. B. Calkins and F. C. Hubbard.

The Center Valley Railway, Light & Power Company, Zanesville, Ohio, is forming a large syndicate to erect numerous plants to furnish heat and light. The company has purchased water rights on the Muskingum River, nine miles south of Zanesville, and started work on the construction of a 5000-hp. electric plant. Bids will be asked for the machinery within the next 60 days, and bids will also be taken on contract work for the erection of the plants and on 74 miles of electric railroad which will be built from Marietta to Zanesville. This work will be commenced as soon as possible. Communications should be addressed to H. A. Williams, general manager, Rogge Hotel, Zanesville.

Cincinnati Machinery Market.

CINCINNATI, OHIO, November 12, 1907.

If it is true that the machine tool industry is the first to feel the depressing effects of a monetary disturbance and the last to receive the invigorating stimulus of a period of great commercial prosperity, a reasonable explanation may be had of the singular situation that seems now to exist in this important field. It has been but a comparatively few days since the manufacturer experienced the first shock, which did not greatly worry him, or at least enough to suggest a reduction of working hours or the laying off of men, and it was not until cancellations began to come in at a 33 1-3 to 50 per cent. rate that he began to look about for the causes and calculate the effects. And even so, if the evidence of one's eyes and ears are to be relied on, the situation appears promising to a degree and the future not at all alarming. At least two-thirds of the tool manufacturing concerns in this field and practically all of those turning out wood working machinery and specialties are still busy on advance orders of a reliable character, which condition will prevail until the end of December. It is largely timidity of the sales agents and the difficulty in making collections that combine to worry the manufacturer, but the assurances of his banker and the knowledge that the country generally is unusually prosperous tend to allay positive fear.

Rumors of wholesale laying off of men have been run down as promptly as heard, and found in the main to have been unauthorized. In one large company manufacturing lathes where it was reported that 70 men had been discharged, it was found that the payroll had been reduced only $200 a week, and that but a few unskilled and handy men had been laid off. This company is now running 54 hr., but will soon reduce to 48 hr. This, in the main, is the existing situation in this field; men are being laid off, but they are largely hands that had been put on during the rush of the early and middle year, and are of the unskilled class. In one of the large institutions making engineers' specialties it was found that the only curtailment has been

a cutting down of time, running now five days a week, and that in number the inquiries and sales have kept up to the standard of past excellence; the difference being seen in the amount of purchases, indicating extreme conservatism. Turning to foreign inquiry and possibilities, it is found that local manufacturers almost as a unit look forward to increased business with Europe and South America with a feeling of great confidence.

At the offices of one of the companies making a specialty of shapers the president states that its shipments for the past 60 days exceeded 50 per cent. to Europe, the figures of one week being of 32 shipments, 18 marked for European ports. One of the big lathe companies reports a very appreciable increase in inquiry from Europe in the last week. Taking into consideration the entire local field, there appears a practically unanimous opinion that the existing depression is but temporary, and that a rally is due within a month or six weeks at the most, but there is more conservatism manifested than in October, and there will not be the volume of stock made up that was talked of then. The promise of $16 or even $15 pig iron for the first quarter of the year, coupled with the unbending independence of the furnaces in their demand of $18 and $18.50 for spot delivery, is a factor, and labor is expected to be more easily handled a few months hence.

The visit to Cincinnati of F. Hammersgold of London, Alfred Larsen of Stockholm and E. O. Sandberg of St. Petersburg was productive of good business in the woodworking machinery lines. They contracted with the J. A. Fay & Egan Company for machinery to cost over $25,000, which will be installed in the plant of the company in London, devoted to the manufacture of telephones and supplies.

The semimonthly payroll of the Newport Rolling Mill Company at present amounts to $21,000, and on Saturday the company posted notices to the effect that payment would be made in clearing house certificates in denominations of $2, $5 and $10, to the amount of 75 per cent., the balance in currency. There was some little confusion from the foreign element, but as a rule the innovations in all plants where payrolls were made up in this manner developed little objection.

The Frank M. Watkins Company, manufacturer of gasoline engines and boats, has assigned to Judge David Davis. The business of the company is located at Sixth and Baymiller streets. Stringency in the money market is the cause given. Assets are estimated at $35,000; the liabilities at $22,500.

In times like the present, there is a vast difference in estimates as to what is the best course to pursue, and the machine tool men of this section are no exception to the rule. Some will practice retrenchment in every department by cutting off all handy men and those not strictly skilled workmen, and in this way there seems to be a general unanimity of opinion. A number will reduce the working hours from 54 to 48 and finally 35. The charge of price cutting is indignantly refuted by nine-tenths of the manufacturers; although it is practically certain that some of the direct sales made in this field the past week or ten days were at reduced prices.

A number of the manufacturers are interested in the organization last week at Dayton of the Iron Buyers' Association. The particular grievance of the iron consumers with the furnacemen, even exceeding the oft repeated charge of excessive freight rates by the railroad men, is the license taken by the furnace people on forward deliveries of iron. A case in point was cited to the representative of *The Iron Age* by a prominent local tool manufacturer, who is also a purchaser and consumer of iron. A certain lot was purchased early in the year for delivery extending over the months of July, August and September. All his pleas for his quota of iron in July and August were unavailing, and the first delivery on the purchase was made on September 14, and the last was dumped in on him on September 26. It is this state of affairs that the new association is committed to improve, together with the furnishing of an analysis on every shipment of iron which, if not forthcoming, shall be made by a chemist at the expense of the shipper. The proposition to extend the new association throughout the Middle West meets with general approval, and it is expected that the organization will number 300 by the first of the year.

Considerable talk in manufacturing circles just now in connection with a proposed manufacturers' exhibition building comes from the machine tool men and allied lines. The new building would be located in the district bounded by Third and Baker and Vine and Walnut streets, which is in the heart of the bottoms district and directly back of the new Sinton Hotel. The project is being worked up by J. E. Q. Maddux of this city, who claims to have the matter well in hand. The building would be 10 stories in hight and an entrance from Fourth street, the principal shopping thoroughfare, would be a feature. President William Lodge of the Lodge & Shipley Machine Tool Company, has given the enterprise his hearty indorsement, and has agreed to rent some space. The J. A. Fay & Egan Company would also be interested, for its president, Thomas P. Egan, has always been favorable to local business extension. The Industrial Bureau will undoubtedly lend its co-operation.

Arrangements for instituting work at the new finishing mill at the plant of the Fort Wayne, Ind., rolling mills directly after Thanksgiving are in progress. The new mill is to be used for finishing up small sizes.

All bids for the plant of the Weber Foundry Company, which last week was placed in bankruptcy, are to be in by November 15. It is the hope of those interested that the foundry may be disposed of to parties who will keep it going, as it is an exceptionally fine one. The foundry is 125 x 300 ft., and has a railroad switch in front. There is a concrete steel foundry building, 90 x 160 ft.; a frame cleaning department, 40 x 60 ft., and a two-story mill construction pattern shop, 50 x 50 ft. The appraised value of the plant is $38,000.

The loss by fire of the temporary building put up for laboratory uses by the Bucyrus, Ohio, Steel Casting Company has not interfered with the operation of the plant, which is regarded as one of the best in the country.

Herman Lieder of Ashtabula, Ohio, has purchased the shops on Centre street, in that city, known as the McLaughlin Iron Works, and will enlarge and improve the property. An auto repair shop has been added.

There is considerable speculation in local manufacturing circles over the reported combination in Dayton and Toledo of the National Cash Register Company, Dayton Computing Scale Company and the Toledo Scale Company, whereby a joint controlling company is to be organized to conduct the business of the three plants. The story says that the product of the three companies would continue to be manufactured in their present locations.

The Combination Lock & Label Company, Cincinnati, is a new corporation, with a capital stock of $10,000, with Martin Mohr, Albert Bode, C. H. Woellun, Fred. Guthlein and P. Young, Jr., as incorporators.

Anthony Heimgardner, S. W. Sherry, J. P. Fitzmartin, William C. Brunner and J. D. Sherry of Dayton, Ohio, have purchased and arranged to conduct the plant of the Delphos Foundry Company, Delphos. It has been idle for two years.

Word from Ironton, Ohio, is to the effect that the work on the Ironton Iron Company's new furnace is practically completed, and that it will soon be in operation.

Work on the new additions to the plant of the Midgeley Mfg. Company, Columbus, Ohio, has been completed. The capacity of the company, which is one of the largest in the world devoted exclusively to the manufacture of automobile wheels and rims, has been doubled.

A new claimant in the Ohio furnace field is the Jackson Iron & Steel Company, Jackson. The plant is exceptionally well located as to ore supply and coal. The company will utilize native and lake ores, and a specialty will be made of a silvery iron. The plant was built under the supervision of Henry Hossman. C. H. Wheeler of Ironton is general manager; Ralph Moore of Portsmouth, mechanical engineer; James G. Morgan, secretary; M. C. Smith, treasurer; Daniel F. Morgan, chemist.

It is reported that Joseph C. Clutts, Jerry Morrow, and E. H. Willis, all of Jackson County, Ohio, have purchased in conjunction with other capitalists an iron ore mine in the Menominee region in northern Michigan. An organization has been effected under the name of the Spring Valley Iron Company. There are 80 acres in the tract and the analysis shows 57 per cent. iron, with rich mineral deposits.

Reports from Columbus state that the Ralston Steel Car Company has acquired additional land, and is steadily making extensions and improvements. President J. S. Ralston talks encouragingly of conditions, says the plant is booked up for at least a year on good contracts and recently took a single order for 20,000 steel underframes.

New England Machinery Market.

WORCESTER, MASS., November 12, 1907.

There is little cheer in the machinery trade, in common with kindred lines of industry, and, in fact, with manufacturing trade as a whole. The dealers have sold a few tools during the week and have other small orders in sight. Practically everything that savors of large business is on the deferred list. The statement of the Boston & Albany Railroad, issued Monday, telling of its plans of improvements, which have been compelled by the action of the Massachusetts Railroad Commission, contains the promise to proceed immediately with the completion of repair shop improvements begun at West Springfield, and this should mean the purchase of a nice lot of tools. But otherwise railroads and manufacturers who have been planning to purchase equipment are waiting until the situation changes. In most cases it is a compulsory waiting, because funds are not available.

The machine tool builders are either reducing their forces or shortening working hours, or both, or else are manufac-

turing for stock in the expectation that the time is not far away when demand will revive. As a rule, the trade does not look to see the present slump continue for any great length of time. There are those who take a less cheerful view of the situation, but the great majority cannot see any good reason why the financial atmosphere should not clear soon in the natural order of things. They believe that the present trouble is due almost wholly to that cause, and that once the cause is removed business should resume on an ascending scale. After the New Year, when inventory has been taken and manufacturers know just where they stand, a renewed tendency may be expected to buy machinery in the carrying out of plans formulated months ago. One dealer puts it that business should begin to improve about January 15 and continue good for several months, after which the Presidential election should have its effect. Prophesics are not so common as they were. Too many of those made in recent months have been wide of the mark, and many men prefer to say nothing excepting in a very general way.

It cannot be learned that prices of machine tools are being sacrificed, in spite of the natural inclination to convert machinery into money. The dealers have large stocks on hand; the manufacturers have been filling stock orders rapidly, though the dealers have been staving off deliveries whenever possible. But in spite of the filled floors of salesrooms and storehouses, the dealers are showing a disposition to maintain the prices that have prevailed, in the realization that it would do a great harm to the trade as a whole, including themselves, if a beginning of competitive price cutting were made. The manufacturers appear to be backing them up in this. Everyone dislikes to contemplate a trade in which the buyer would be permitted to shop around, causing dealers to bid, one against the other, for once it were started a profitless market would result.

In considering the general situation here in New England it should be remembered that the machine tool trade and its allied lines are suffering most of all. This is always the case when business slackens, for the first curtailment of expense by customers is a cessation in improvements. Textile machinery manufacturers are not so busy as they were and some of them are laying off men, but not to any great extent up to the present time. These have even purchased a few tools during the last few days. One of the largest of the textile machinery works reports that there is less business than there was, but cancellations are few, and there is no great disposition among customers to ask that their orders be held back. The textile lines are not seriously affected as a whole, and the same is true in other staple lines. There have been a few failures, but generally these have been due to the financial situation rather than to a condition of insolvency.

Among the great hardware manufacturers of New England, who are large buyers of machine tools, including the New Britain factories, the opinion prevails that business will revive with the New Year, after inventories have been taken. They are not manufacturing for stock, and neither are they buying raw materials and supplies, excepting as absolutely needed. They are running shorter hours, as a rule, and are laying off some men. Their opinion is that buying is bound to begin as soon as the financial situation clears. The crops will soon have been moved, money will be easier, and the effects of heavy buying from the South and West will be felt.

Stocks are low everywhere. No exception to the rule can be found among the manufacturers, and in this lies one of the most encouraging aspects of the situation. In nearly every line there are empty storerooms, both for raw materials and finished products, and general supplies are equally low. Talks with several purchasing agents emphasize the fact that they are buying as scantily as possible, keeping a tight hand on all expenditures, that financial resources may be husbanded and advantage taken of any lower prices that may be created. In some cases shutdowns and curtailments are due in part to a disinclination to go ahead with manufacturing at the present prices of raw materials.

Some of the newspaper reports of the curtailments by manufacturers have been grossly exaggerated. One such instance is that of the Coe Brass Company, Torrington, Conn., which a newspaper had discharging 700 men, and the story has gone broadcast. The actual fact, as explained by the company, in making denial of the story, is that some 50 men were laid off because certain outside work was completed. As a matter of fact, the statement went on to explain, the works are running with some slight falling off of business. The brass business of the Naugatuck Valley has felt the depression to some extent, but not to the degree that has been published.

The reports brought into New England from the New York automobile shows are not such as to indicate a probable change in the plans of the manufacturers as to their production for next year's business. No more unpropitious time could have been chosen for the shows; the money market did not tend to encourage the ordering of cars, with the necessary substantial advance payment, and this fact should be taken into account in considering the prevailing attitude of possible buyers. Yet no one in the automobile trade seriously believes that 1908 will be as good a season as that which is just ending, and the manufacturers will undoubtedly govern their production accordingly. So far as the New England builders have expressed themselves, they will curtail in the number of cars built, and will do little in the way of new equipment. Last season at this time the industry was a voracious buyer of machine tools.

The Machinery Exchange, Oliver Building, at Oliver and Milk streets, Boston, is growing rapidly, and it has become necessary to take another store in the building. The present store opens on Oliver street; the new store on Milk street, the two connecting at the rear forming an ell. The original 14 tenants will be increased to about 40 when the new space has been made ready for occupancy, the work of which is now proceeding.

The Laconia Car Company Works, Laconia, N. H., with main offices 100 Boylston street, Boston, announces that it will manufacture steel under frame cars at Laconia. Plans are not completed, but the company expects to build any kind of freight or passenger cars having structural steel under frames, and work on the new line will begin so that cars will be ready for delivery about July 1, 1908. Equipment will be installed to give a capacity of approximately 12 such per day. The dealers do not know that orders for new equipment have been placed, and are investigating the matter.

The New England Investment & Security Company, which holds the electric railroads of the New York, New Haven & Hartford Railroad, is to concentrate its purchasing departments at Boston and New Haven. The Boston office will do all the buying for the Massachusetts lines, including a very large mileage, because the company controls the greater part of the street and interurban railroad systems in southern, central and western Massachusetts. The New Haven office will buy for Connecticut and Rhode Island, which will give it at least equal prominence with the other division.

A special committee consisting of Charles W. Eliot, president of Harvard University; Rev. Fr. Thomas I. Gasson, president of Boston College, and Henry S. Pritchett, former president of the Massachusetts Institute of Technology, has submitted a report recommending the expenditure of $500,000 for the rearrangement of enlargement of the Boston Mechanics' Arts High School. The committee was appointed to investigate the general question by the finance commission of the city, and its report should have much weight with the city government, to which it has been submitted. Such an enlargement would mean the purchase of a large amount of equipment, including machine tools and other machinery, for the school is conducted on a very practical basis in its training of young men in the mechanics' trades.

The Spencer Turbine Cleaner Company, Hartford, Conn., has been incorporated to manufacture a suction cleaner for the removal of dust and dirt from buildings. The company has space in the building formerly occupied by the Woven Wire Mattress Company, where it will establish its factory. Ira H. Spencer is the president; F. E. Pratt, vice-president, and Charles E. Bond, secretary and treasurer. The cleaner is an air pump, in which the turbine principle is embodied to produce the necessary vacuum, and operated by electric motor or other available power. The company has an authorized capital stock of $200,000.

Government Purchases.

WASHINGTON, D. C., November 12, 1907.

The Isthmian Canal Commission will receive bids until December 6, circular No. 402, for the following supplies: Class 1, four 250-gal. water pumps; class 2, two 500-gal. water pumps; class 3, one tool room engine lathe; class 4, one portable riveter; class 5, six pneumatic riveters; class 6, three motors.

The Isthmian Canal Commission will soon ask bids for four pipe threading machines.

The Bureau of Yards and Docks, Navy Department, Washington, will receive bids until November 23 for power plant equipment for the United States Naval Hospital at New Fort Lyon, Colo.

Bids will be received until November 18 at the office of the United States Engineer, Portland, Ore., for four hoisting engines, three locomotives and two boilers.

The following bids were opened November 4, Circular No. 396, for supplies for the Isthmian Canal Commission:

Bidder 23, Fox Bros. & Co., New York; 40, Manning, Maxwell & Moore, New York; 42, Motley, Green & Co., New York; 51, Niles-Bement-Pond Company, New York; 59, Prentiss Tool & Supply Company, New York; 64, Joseph T. Ryerson & Son, Chicago, Ill.; 75, Toledo Machine & Tool Company, Toledo, Ohio; 86, Williams, White & Co., Moline, Ill.; 96, Drew Machinery Agency, Manchester, N. H.

Class 2. Two punching and shearing machines—Bidder 23, $1398 and $1298, 90 days; 40, $1625, 110 days; 42, $1705, 120 days; 51, $1440, 100 days; 59, $1687, 85 days; 64, $1284, 75 days; 75, $1630, 84 days; 86, $1735 and $1695, 120 days; 96, $2000, 90 days.

Class 3. One horizontal punching machine—Bidder 23, $888, 90 days; 40, $962, 110 days; 42, $1320, 150 days; 51, $875, 100 days; 59, $963, 125 days; 64, $845, 75 days; 86, $985, 120 days; 96, $998.50, 90 days.

Bids were opened November 5 for supplies for the navy yards as follows:

Bidder 11, Ajax Mfg. Company, Cleveland, Ohio; 30, Bullard Machine Tool Company, Bridgeport, Conn.; 48, Craig, Ridgway & Sons Company, Coatesville, Pa.; 52, Chicago Pneumatic Tool Company, New York; 64, Cincinnati Electrical Tool Company, Cincinnati, Ohio; 87, Fairbanks Company, Philadelphia, Pa.; 90, Fox Machine Company, Grand Rapids, Mich.; 91, Fairbanks Company, Boston, Mass.; 93, W. H. Foster Company, New York; 99, Garvin Machine Company, New York; 103, R. W. Geldart, New York; 109, Henshaw, Bulkley & Co., San Francisco, Cal.; 120, Harron, Rickard & McCone, San Francisco, Cal.; 122, Hendey Machine Company, Torrington, Conn.; 123, Hisey-Wolf Machine Company, Cincinnati, Ohio; 126, I. H. Johnson, Jr., Company, Philadelphia, Pa.; 137, Knox & Bro., New York; 156, Montgomery & Co., New York; 157, Monarch Emery & Corundum Wheel Company, Camden, N. J.; 161, Manning, Maxwell & Moore, New York; 170, Manhattan Supply Company, New York; 175, Norton Company, Worcester, Mass.; 180, National Electric Supply Company, Washington, D. C.; 182, Niles-Bement-Pond Company, New York; 187, Oliver Machine Company, New York; 198, Prentiss Tool & Supply Company, New York; 203, Pneumatic Appliance Company, New York; 206, Quincy, Manchester, Sargent Company, New York; 225, J. B. Roach, Brooklyn, N. Y.; 278, Vandyck, Churchill Company, New York; 281, S. A. Woods Machine Company, South Boston, Mass.; 285, Williams, White & Co., Moline, Ill.; 287, Whiting Foundry Equipment Company, Harvey, Ill.

Class 1. One special air hydraulic jib foundry crane—Bidder 48, $1800; 206, $1000; 287, $1200.

Class 2. Two bolt heading machines—Bidder 11, $3612; 109, $4320, $4330, $4490 and $4500; 120, $4019; 161, $4280, $4299 and $4385; 285, $5000.

Class 141. One instantaneous change engine lathe—Bidder 99, $1670; 122, $1478; 126, $1704 and $1580; 161, $1800 and $1478; 182, $1827 and $1746; 278, $1600.

Class 142. One gear head engine lathe—Bidder 122, $1040; 161, $1040 and $745; 182, $991.

Class 143. One 32 in. by 16 ft. instantaneous change engine lathe—Bidder 99, $2380; 126, $2365 and $2185; 161, $2450; 182, $2191 and $2422; 278, $1928.

Class 144. One 18 in. by 12 ft. gear head engine lathe—Bidder 87, $1125; 99, $1210; 122, $1332; 126, $1344; 161, $1332 and $1260; 182, $1093; 278, $785.

Class 145. One motor driven engine lathe—Bidder 87, $1240; 99, $1185; 122, $1390; 126, $1255; 161, $1390 and $1050; 182, $1154.

Class 146. One boring and turning mill—Bidder 30, $1969.50, $1864.50, $2169.50, $2064.50, $2545.60, $2440.60, $2845.60 and $2740.60; 87, $2285 and $3285; 93, $2570; 161, $2900; 182, $2335 and $2820.

Class 147. One automatic screw cutting machine—Bidder 161, $1900.

Class 148. One No. 2 heavy hand planer—Bidder 87, $565; 90, $535; 161, $595; 187, $672, $732, $520 and $550.

Class 151. One automatic plug machine—Bidder 281, $1150.

Class 161. Two high speed engine lathes—Bidder 91, $3065; 122, $2383; 126, $3853; 182, $2944.

Class 191. Electric grinders, &c.—Bidder 52, $1034.96; 64, $528.89; 103, $1212; 123, $1226.31; 137, $1223.52; 156, $1212.15; 157, $10.24, part; 161, $1212; 170, $1212.30; 175, $15.36, part; 180, $1212; 198, $1032.78; 203, $911.22; 225, $1222.08.

The following bids were opened November 6 for ventilating fans, &c., for United States Capitol:

National Electrical Supply Company, Washington, D. C., $1625.

B. F. Sturtevant Company, Hyde Park, Mass., $1695.

Deihl Mfg. Company, Baltimore, Md., $1800.

Buffalo Forge Company, Buffalo, N. Y., $1800.

The Missouri Boiler & Sheet Iron Works, St. Louis, Mo., has been awarded contract for two boilers for Jefferson Barracks, Mo.

The following awards have been made for supplies for the navy yards, bids for which were opened October 29:

Sherman-Brown-Clements Company, New York, class 144, one valve reseating machine, $325.

Manning, Maxwell & Moore, New York, class 145, one valve reseating machine, $325.

Under bids opened October 22 for supplies for the navy yards the following awards have been made:

Independent Pneumatic Tool Company, class 91, one pneumatic drill and one hammer, $89.75.

Frye, Phipps & Co., Boston, Mass., class 92, one valve reseating machine, $325.

The Cincinnati Foundrymen's Association.

An unusually large attendance marked the annual meeting of the Cincinnati Foundrymen's Association on the evening of November 7 at the Grand Hotel. After the enjoyment of a dinner a comprehensive paper was read by President George McG. Morris dealing with the history of Cincinnati foundries, and some interesting addresses were made by Messrs. Haney of the Globe Foundry, Spear of the Elmwood Castings Company, Victor Knecht and others on organization. S. Blackburn of the Morris Foundry Company, who was a delegate from Cincinnati to the Dayton meeting of the morning, reported the determination of the new Iron Buyers' Association to require a new uniform contract with the furnacemen on forward business, and of the railroads a more equitable rate from the Birmingham District. Messrs. Blackburn and Theo. Boilman were appointed a committee to co-operate with the new association in the matter of deliveries on contract. The new officers are: Geo. McG. Morris, president; H. H. Uckotter, first vice-president; L. C. Twachtman, second vice-president; Henry J. Weber, secretary; A. G. Wilson, treasurer; H. D. Erhart and John J. Bruce, Executive Committee.

The New York State Steel Company in Receivers' Hands.

At Buffalo, N. Y., November 6, three receivers were appointed for the New York State Steel Company. They are Spencer Kellogg, Sr., George Urban, Jr., and Adolph Rebadow. A joint bond in the sum of $100,000 was filed. The following statement was given out:

"Owing to the severe stringency now existing in the business world, it has been deemed best to have a temporary receiver appointed. The company is perfectly solvent, and the action that has been taken is only temporary."

The New York State Steel Company was organized by Spencer Kellogg three years ago. The total capital was $4,500,000, consisting of $3,000,000 bonds and $1,500,000 of stock. A large tract of land was obtained on Buffalo River, and an open hearth steel plant built thereon was recently put in operation. A blast furnace is now under construction.

The appointment of the receivers followed the filing of a bill in equity in the United States Circuit Court, in which the plaintiffs are John C. Cromwell of Cleveland, a stockholder in the steel company, and the Garret-Cromwell Engineering Company of Cleveland, a creditor to the extent of about $30,000. The suit is stated to be a friendly one. There will be no stoppage in the operation of the steel plant nor in the construction of the blast furnace, which will be pushed to completion as rapidly as possible.

Jamestown Exposition Awards.

The General Electric Company, Schenectady, N. Y., has been awarded two gold medals, a bronze medal and a silver medal, for its exhibits at the Jamestown Exposition. The exhibits were in three departments. A gold medal was awarded for a collection of motors applied to various tools and other devices. Another gold medal was awarded for arc and incandescent lamps and electric motor applications. A bronze medal was awarded for a special motor designed particularly for use with an Ingersoll-Temple pneumatic rock drill. A silver medal was further awarded for installations of exhibit.

Charles A. Schieren & Co., New York, were awarded a gold medal for their Duxbak waterproof and Duxbak steamproof leather belting, the exhibit of which was one of the special features of Machinery Hall.

The Pittsburgh Automatic Vise & Tool Company, Pittsburgh, Pa., was awarded a gold medal for its vises. The award was not only upon each style of vise manufactured by the company, but upon the entire exhibit.

HARDWARE

SOME of the railroads of the country are planning to utilize the trolley lines to cover a broader field in solving the problem of the congestion of freight in the larger centers, and that of increasing the mileage of freight cars by relieving them of the long delays resulting from the failure of consignees to remove their contents. We have discussed in this column the advantages of trolley express and those of trolley freight, especially the utilizing of trolley tracks for the hauling of freight cars from the railroads to the premises of customers located off the steam lines but adjacent to electric roads, so that spur tracks may be put in, if necessary. The attention which this matter is receiving, as well as something of the scope of the improvements which may be adopted, is indicated in a plan which has recently been proposed for using a new form of vehicle, in which is combined the ability to operate on electric tracks, taking its power by trolley, with the broader scope of action of motor trucks, leaving the rails in order to get to places of business located off the line. Such a system would obviously extend the delivery of freights to a very considerable degree, and it is further claimed for it that the expense to patrons would be less than that incurred with the use of horse vehicles for hauling freight to and from the yards, or with the smaller types of motor trucks.

Such a trolley freight truck would combine the power and speed of the trolley car with the radius of action of the motor truck, if it were so arranged as to take power from the trolley wire for motive purposes while on the track and also for the charging of storage batteries giving the required power when running in a street or highway. By a special derailing device it would be a simple matter to leave or take the tracks at any desired point on the trolley system. Experiments with cars of the type, of 3 and 4 tons capacity, have, it is said, demonstrated their practicability. The New York, New Haven & Hartford Railroad, which has been highly enterprising in developing the use of the electric roads as an auxiliary of a steam system, believes that it can advantageously combine the new type of car with its already established trolley freight system, which is being rapidly extended in the New England cities and their suburbs. The details of the plan have not been worked out; various considerations must first be carefully studied. It has been suggested that distributing depots be established at convenient points on the electric system, to which freight cars would be hauled and their contents stored, so that the cars could be immediately released, their contents to be distributed by the new type car as soon afterward as possible.

The primary object of the system is to relieve the freight yards, depots and cars. Where the average daily mileage of a car is 25 miles, it should, according to railroad men, be increased to 75 or 100 miles. Such an extension of usefulness would go a long way toward ending the frequent freight congestions due to an insufficient number of cars, for it would be the equivalent of adding a great amount of rolling stock. The cost of extending freight yards in the cities is another very important item of expense which the trolley freight system is intended to reduce. While the action of the railroads is not based on philanthropic motives, yet the business public would be better served, and, it is claimed, more economically. Further developments along this line will be awaited with interest, for the matter is of much practical importance. There is evidently little reason to doubt that progress in the direction of the carriage of freight by trolleys, and probably in connection with motor trucks, is to be expected. It may be that the new methods of distribution thus evolved will do something toward relieving the too heavy pressure which in times of active business is made upon existing transportation facilities.

Condition of Trade.

There is little reason for dissatisfaction with the condition of retail business throughout the country, as merchants generally are well occupied in the distribution of goods, which are moving in fair volume if not with quite the usual freedom. Stocks in most cases are well assorted, but orders for replenishing are frequent and jobbers report that they are kept busy in executing them. The wholesale houses find but little occasion as yet to place orders except for small quantities covering immediate requirements. Manufacturers are feeling the effect of this condition of things, and in some lines the force of workmen is being reduced and unwonted economies practiced wherever possible. There is, however, little disposition to cut prices with a view to forcing sales, and the changes in the market are accordingly comparatively few. Indeed, the cost of making goods has not as yet been materially reduced, especially when it is remembered that goods on hand represent high costs of material and a high level of wages. While it is obvious that in the present situation all classes in the trade should be careful and conservative, they should avoid the error of undue apprehension in regard to the future course of things, remembering the splendid prosperity of the country and especially the great agricultural sections whose well being so immediately contributes to the general welfare. It is well, too, to take refuge in the reflection that a slackening in the pace is necessary, and that a relaxed pressure in business, while unwelcome, will tend not only to put things in more normal shape, but to check disturbing influences which have had something to do with the development of existing distrust and disturbance. The trouble is evidently essentially monetary rather than commercial. This being the case, the merchants throughout the country will do something to relieve the financial stringency by giving special attention to their collections and remittances, which will, at this time, be peculiarly valued by the jobbers and manufacturers in the larger centers.

Chicago.

Though still restricted in its movements by want of a normal volume of currency, and checked to some extent by the extreme conservatism inspired by collateral conditions, trade holds remarkably well against these opposing influences. Jobbing Hardware merchants report a steady run of orders, which, though individually smaller than usual, aggregate a satisfactory business. In fact, surprise is expressed that trade is affected as little as it is. Aside from the fact that country merchants are ordering with greater frequency and evidently for nearby requirements, there is nothing to indicate very strong retrenchment as yet in consumptive demand. Even in the local city trade, where it would seem reasonable to expect the first and strongest effects of existing conditions, retail business has suffered no marked reaction. November

business will doubtless show some falling off in totals over that of the preceding month, but unless a sharp decline takes place in the succeeding weeks the reduction will be but moderate. In view, however, of the shortening of operations in manufacturing plants, the halt in new building improvements and the laying off of men, business in Hardware lines cannot be expected to maintain its present volume. Of the goods now moving Guns, Ammunition and Shooting Accouterments are conspicuously active, while approaching winter weather has stimulated the demand for Stoves, Stove Boards, Stove Pipe, &c. Prices generally are well maintained, but except for a slight advance in Copper Wire and Copper Sheets, such changes as are noted are toward lower levels. No sweeping reductions are reported in any line, and in the present state of the market, with buyers committed to the policy of conservatism in buying, it is realized that wholesale concessions would impair rather than stimulate trade. Scarcity of currency has necessitated the acceptance of checks in current transactions, but merchants generally are accommodating themselves to the situation, so that no hardship has been entailed upon their customers on this account. A fair demand for Iron and Steel goods in Heavy Hardware is noted, but orders from Wagon manufacturers are very light. These interests are running very slack and are buying very sparingly.

NOTES ON PRICES.

Wire Nails.—The market for Wire Nails, Barb Wire, &c., continues to be characterized by a general maintenance of prices, with a fair volume of business. Most of the shipments by the mills are on old contracts, there being only a moderate call for Nails at the recently advanced prices. This is because the larger merchants purchased freely before the new prices went into effect, rather than from any distrust of the market. While jobbers are quite conservative in their purchases of Hardware in general on account of the existing financial stringency and the possibility of the development of lower prices on raw material and finished products, Wire Nails are generally regarded with a good deal of confidence, partly because of the expectation that the leading interest will use its great influence in upholding the market and preventing so far as it can an undue break in prices. In this effort it has for the present at least the co-operation of other manufacturers, so that on the whole the producers of this line are thus far pursuing a conservative course and prices are regularly maintained. From the jobbers' warehouses there is a fairly free movement of small lots for the replenishing of retailers' stocks. Quotations on base sizes are as follows, f.o.b. Pittsburgh, plus actual freight to point of delivery, 60 days, or 2 per cent. discount for cash in 10 days:

Carloads, to jobbers	$2.05
Carload lots, to retail merchants	2.10

Chicago.—Due principally to the exceptional scarcity of money, jobbers are restricting their orders to nearby needs and new business has to this extent been checked. The retail trade, however, has not, so far, been materially affected, and on the whole the demand continues good. Stocks everywhere are represented to be low, which, in view of the heavy stream of shipments that for months has been pouring from the mills, indicates a remarkable consumptive demand. Quotations are as follows: $2.23 in car lots to jobbers, and $2.28 in car lots to retailers, with an advance of 5 cents for less than car lots from mills.

Pittsburgh.—The Wire Nail trade is slow in feeling the depression existing in other lines of Iron and Steel, new demand still being of large volume, while shipments against contracts by the mills are heavy. Stocks of Wire Nails all over the country are light and consumers still insist upon prompt shipments. We are advised that prices are being firmly maintained, and with continued favorable weather the mills anticipate a heavy demand for some time ahead. Quotations are as follows, f.o.b. Pittsburgh, plus actual freight to point of delivery, 60 days, or 2 per cent. discount for cash in 10 days:

Carloads, to jobbers	$2.05
Carload lots, to retail merchants	2.10

New York.—A fair demand continues for small lots at store, considering the season and the fact that finishing up work and repairing constitute the larger part of activity in building operations in nearby territory. Local jobbers and Nail houses are holding small lots at store at $2.35 base, and in general this price is fairly well maintained.

Cut Nails.—The Cut Nail market is not in quite so satisfactory a condition as is that for Wire Nails. The volume of current business from the mills to jobbers is moderate. This may be in part, owing to the fact that there is not a very confident feeling in regard to the maintenance of prices, and slight concessions are readily obtained. There is not, however, much new business in sight, and the mills are on the whole refraining from forcing sales by offering low figures. While the market continues to be represented by the quotation of $2.05 to $2.10 with freight from Pittsburgh, a slightly lower base price is sometimes made, or if the delivered price is quoted the amount added does not always cover the full charge for freight.

New York.—The demand in this market is comparatively light, but small sales are frequent. Quotations for small lots at store range from $2.30 to $2.35, base, the former price being more or less general.

Chicago.—In contrast with the very satisfactory trade in Wire Nails, the demand for Cut Nails is extremely quiet. But little business has been done by local jobbers during the past week and the condition of the market is such that no good orders would be declined at a shade below current quotations. Mills are apparently not pressing hard for new business, mainly because such efforts would probably result in demoralization of prices to no purpose. Chicago quotations are as follows: Iron Cut Nails, carloads, to jobbers, $2.38; to retailers, $2.43; Steel, to jobbers, in carloads, 2.28; to retailers, $2.33.

Pittsburgh.—There is not much new demand for Cut Nails, the mills running nearly altogether on specifications against contracts. Prices on Steel Cut Nails are rather weak, but on Iron Nails are firm. We quote Steel Cut Nails at $2 to $2.05, f.o.b. Pittsburgh, for carload lots, and small lots at $2.10, to which freight to destination is added. Iron Cut Nails are being held at about $2.15, at mill.

Barb Wire.—Most of the business is in execution of old contracts, as comparatively few orders for quantities are now being placed. Most of the larger buyers had indeed covered their requirements previous to the last advance, so that there is no need for their buying at present, and the condition of the market is not such as to encourage speculative purchases. Prices are, however, in general admirably maintained, and a conservative policy is being pursued by the leading manufacturers. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Gal.
Jobbers, carload lots	$2.20	$2.50
Retailers, carload lots	2.25	2.55
Retailers, less than carload lots	2.35	2.65

Chicago.—The near approach of winter weather has lessened the demand for Barb Wire, and but few new orders are being booked. The mills are now occupied mainly with specifications against contracts. Prices are being firmly maintained. We quote as follows: Jobbers, Chicago, car lots, Painted, $2.38; Galvanized, $2.68; to retailers, car lots, Painted, $2.43; Galvanized, $2.73; retailers, less than car lots, Painted, $2.55; Galvanized, $2.85; Staples, Bright, in car lots, $2.35; Galvanized, $2.65; car lots, to retailers, 10 cents extra, with an additional 5 cents for less than car lots.

Pittsburgh.—There is very little new demand, the mills being engaged in cleaning up contracts against which specifications are still being received. While new demand is dull we are advised that prices are being maintained. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Gal.
Jobbers, carload lots	$2.20	$2.50
Retailers, carload lots	2.25	2.55
Retailers, less than carload lots	2.35	2.65

Smooth Fence Wire.—The extent to which Smooth

Fence Wire is in one form or another taking the place of Barb Wire is indicated in the amount of new business which is coming into the mills. The orders for Smooth Fence Wire thus received are referred to as very satisfactory in volume, even though the demand reflects the care and caution which are being exercised in the conduct of business at this time. Prices are well maintained. While the mills are desirous of avoiding a break there is not the offering of enough large business to put the market to a serious test. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. for cash in 10 days:

Jobbers, carloads.....$1.90
Retailers, carloads..... 1.95

Chicago.—In spite of monetary conditions, which are adversely affecting business in other lines, the demand for Wire continues strong and active. Shipments are being urged, though some difficulty is experienced in arranging settlements on account of impaired banking facilities. No tendency toward irregularity in prices is noted. Quotations are as follows: In car lots, to jobbers, $2.08, f.o.b. Chicago, and to retailers, $2.15.

Pittsburgh.—New demand continues active, and specifications against contracts are coming in very freely, shipments by the mills being about as heavy at present as at any time this year. The market is firm, and we are advised prices are being rigidly held. Quotations for base numbers 6 to 9 are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carloads.....$1.90
Retailers, carloads..... 1.95

Rope.—Buyers continue to order in small lots, evidently to cover immediate requirements, as requests for prompt shipment usually accompany orders. Competition is keen enough to make it difficult to maintain prices on the former basis, which are now out of proportion to the present cost of Fiber. The majority of manufacturers refer to business as quiet, and under these circumstances the market is somewhat irregular at the following prices: Pure Manila, 11½ to 12½ cents; B quality grades down to 9 to 9½ cents; Pure Sisal, 9 cents; lower grades Sisal, 7¼ to 7½ cents; No. 1 Jute, ¼ in. and up, 8 to 8½ cents; No. 2 Jute, 7½ to 8 cents.

Leather Belting.—The annual conference of manufacturers of Leather Belting takes place this week. This event usually affords a good basis on which to judge the market for the succeeding year. Individual manufacturers take a favorable view of the future, stating that the present situation in Leather Belting is healthy and that contracts are being placed in good volume.

Ice Cream Freezers.—Manufacturers of Ice Cream Freezers and their selling agents report that a good volume of business is being booked for next season, and no irregularities in prices have as yet developed.

Coat and Hat Hooks.—A slight tone of weakness is observed in the market for Wire Coat and Hat Hooks, manufacturers showing a disposition to shade quotations 5 or 10 per cent. where orders are in sight.

Registers.—Manufacturers who are in a position to speak authoritatively regarding the Register market assert that prices are still being strictly maintained, and there is no prospect of a change before the first of the year. Some goods are being offered at low prices by the few outside producers, but their output is so limited that it cuts little figure in the market. What action the manufacturers may take in January will, of course, depend upon the conditions prevailing at that time.

Shovels.—The market is without important change in prices, which are in general more evenly maintained than has frequently been the case. While jobbers are as a rule buying only to cover immediate requirements, there is still a fair volume of orders, as their stocks are in many cases low. While business thus has fallen off to some extent, one reason for prices continuing fairly firm is that the manufacturers find them low compared with present manufacturing costs. Labor is no cheaper. Shovel plate is still high, and the handle problem is growing steadily more acute owing to the increasing scarcity of desirable lumber. Retailers, except where they deal direct with manufacturers, generally continue to buy Shovels at net prices, as quoted by most jobbers. Independent manufacturers, however, have recently made efforts to secure greater uniformity in the market, and are quoting to an increasing extent by naming discounts on the standard list. A few makers quote discounts or stated deductions for an individual list of their own.

Copper Products.—Rumors and contradictions of rumors have been plentiful as to the relative amount of Raw Copper taken for shipment abroad, much of which is attributed to speculative sources for its prospective effect on values. There is, however, no insistent demand for Copper material and related products, buying still being listless and for limited actual necessities. While no changes or readjustments in base prices have as yet been made, the halt in Copper Ingot prices, it is expected, will cause such a revision in the near future. Sheet Copper, nominally 20 cents base, is being sold in the main at that price, although the inclusion of heavy plates and some stock contracted for at lower prices established an average price, with one representative source approximately 19 1-3 cents for the past week, and 19 2-5 cents for November to date.

Window Glass.—As a result of the agreement entered into by hand operating manufacturers, who are members of the Window Glass Manufacturers' Protective Association, recently formed at Columbus, Ohio, that the sliding scale of wages adopted should be supported, fires in several of the factories have been banked. The sliding scale of wages has not met with favor by the Amalgamated Association, which still adheres to their 12½ per cent. reduction on the scale of last fire, so that there is no immediate prospect of a resumption of Glass making, although an attempt is being made to start an Ohio factory on the sliding wage scale. The *National Glass Budget* states that wages are to be regulated by the price of Glass, on the following basis:

> When the selling price of Window Glass is equivalent to 90 and 12½ per cent. off, net, manufacturers' selling list of January 1, 1901, the scale shall be paid in full. When the selling price of Glass is greater than 90 and 12½ per cent. off the manufacturers' list of January 1, 1901, the scale shall be paid plus 1 per cent. for each and every ½ per cent. the selling price advances above 90 and 12½ per cent. When the selling price of Glass is less than 90 and 12½ per cent. off, the scale shall be paid less 1 per cent. for each and every ½ per cent. the selling price goes below 90 and 12½ per cent. off the manufacturers' list of January 1, 1901.

The above also gives an indication of about the price manufacturers anticipate getting for their Glass. Buying is usually brisk at this season, but purchases are not now being made on as generous a scale as is expected during the fall months. Stocks have being reduced by continued small purchases, so that assortments are broken, and what Glass is left in manufacturers' hands is of more or less undesirable sizes. Some are of the opinion that first and second quality Glass will command a premium within the next 30 days. Demand is light at this point, and prices more or less weak at prevailing quotations. Prices recommended by New York jobbers are as follows: Single strength 90 and 10 per cent. discount, double strength 90 and 20 per cent. discount. These discounts apply to purchases up to 50 boxes. Over 50 boxes the prices are 5 per cent. better.

Linseed Oil.—A reduction was made by the crushers of 2 cents per gallon in the price of Oil on the 11th inst. Calcutta Oil was reduced 1 cent per gallon. The lower prices are attributable to recent declines in the price of Seed, also to the falling off of demand on account of financial conditions. The market has been very quiet since the reduction in the price of Oil. The market was as a rule steady at the new price. At this point State and Western Raw, in 5-bbl. lots, is quoted at 45 cents and City Raw at 47 cents per gallon. Boiled Oil is 1 cent advance on Raw Oil. Calcutta Raw is reduced in price 1 cent, or 69 cents per gallon.

Spirits Turpentine.—During the week this market has declined steadily in sympathy with the Savannah market. According to a prevailing impression there are

supposed to be stored in the South about 30,000 gal. of Turpentine by the independent interests, which was purchased at from 62 cents down, and other interests are depressing values so as to dislodge these holdings. Buyers are slow in making purchases, and sellers are not anxious to make sales at a heavy loss. If the market was not being manipulated higher values might be expected, if reports of an acute shortage over the entire Turpentine belt are accurate. The New York market is weak at the following quotations, according to quantity: Oil Barrels, 47½ to 48 cents; Machine Made Barrels, 48 to 48½ cents.

PARCELS POST ON RURAL ROUTES.

THE following letter from S. R. Miles, president of the National Retail Hardware Association, to the Postmaster-General in which the project of establishing a parcels post on rural free delivery routes is discussed, will be read with interest as stating clearly and forcibly the objections to such a system from the standpoint of the local merchants of the country:

MASON CITY, IOWA, November 7, 1907.

Hon. Geo. von L. Meyer, Postmaster-General, Washington. D. C.

DEAR SIR: I have your favor of the 30th ult. inclosing copy of your speech before the postmasters' convention in Boston, October 12, and other literature, and requesting me, as president of the National Retail Hardware Association to make comments and criticisms on same. Without entering into a detailed discussion of all of the points raised in your speech, permit me to touch briefly on some of them.

There is only one theory upon which we can discuss your proposed plan and that is, that inside of 12 months after it was put into operation your department, and the country at large, would use the same argument that you are now using to justify the reduction from 16 to 12 cents per pound on third and fourth class matter. That argument would be that it was unfair and unjust discrimination, and that all barriers must be removed and everybody permitted to mail matter on the same basis. The contention would be a reasonable one and would, without question, be granted.

For the benefit of the country retail merchant and the farmer, you propose making a rate of 5 cents per pound for the first pound and 2 cents per pound for each additional pound up to 11 pounds; making a total charge of 25 cents for 11 lb. This, you say, would be a boon to the country retailer and rural patron. Under a recent ruling of your department any rural patron can have delivered to him by his carrier any package weighing in excess of 4 lb., and if it happens to be matter that is not mailable, the weight can be under 4 lb. For rendering service of this kind, not one carrier in a hundred will make any charge. With this free service at the command of the rural patron, the facts are that he is not using it. Yet you would have us believe that if you raised the limit of weight to 11 lb. and compelled him to pay 25 cents for the service, that he would use it and be greatly benefited. I must confess that no line of reasoning that I am able to follow will permit me to agree with you. If you will take the trouble to investigate you will find that the demand upon rural carriers for service of this kind does not average one call per week per carrier. It would seem, then, that your proposed plan would, after all, not be much of a boon to the rural patron.

Now, about the country merchant, the other interested party who is to derive so much benefit by being able to secure most of his wares by parcels post. I can readily understand that nine merchants out of ten would inside of 12 months after a general domestic parcels post became effective, be able to supply the demands of their trade with 11 lb. packages. Of what advantage would it be to the merchant to use a parcels post for the delivery of his packages when to nearly every point in the United States 100 lb. can be shipped by freight at a maximum cost of 40 cents, and in most States only 25 cents?

The future prosperity of the United States depends to a greater extent upon the prosperity of the rural communities and smaller villages and cities than upon any other condition. Any legislation that will take away from the retail merchants of the country even 25 per cent. of their present volume of business would mean absolute ruin to 90 per cent. of the merchants of the country inside of 12 months. If a money flurry or panic lasting only a year or two so reduces the volume of business as to throw into bankruptcy thousands of merchants what would be the result if this reduction were made permanent?

It appears to me that it would be high time for your Department to advocate a domestic parcels post when the demand came from the people whom you claim would be so largely benefited; that is the country retailer and the farmer.

There is only one way in which a retail merchant could take advantage of and be benefited by your proposed plan even if it were confined strictly within the limits you propose, and that is by issuing a priced catalogue covering every item in his store. This not one merchant in 10 could afford to do. It would compel him to have one price for delivery by mail and another price to people who called at his store and made their purchases in person. This plan would not be at all practical and would cause no end of trouble and confusion. While, on the other hand, the mail order houses (whom this proposed plan is clearly intended to benefit) would price every article in their catalogue on a delivery basis and eliminate all the nonprofit bearing goods, leaving that class of business to the few remaining country merchants.

You cannot increase a merchant's trade by any plan that will keep people away from his store, making it possible for them to make their purchases at home. A system of this kind would mean a serious curtailment of business, and the people under this condition would buy only necessities, and it would be a sorry day for the business interests of this country when the mercantile business was confined to the mere necessities of life.

The retail merchants are not asking for this special or class legislation. The demand for your proposed plan is not coming from that source, as it would decrease rather than increase their business. If this is true, wherein would it be of any advantage to the farmer? What the farmer wants is more prosperous towns and villages, more local or home markets, and not an opportunity to save a few cents occasionally by being able to ship his merchandise by mail.

In your address you refer to the fact that rural free delivery has done away with the isolation which existed in many parts of the country. Your proposed plan would bring about a return of this isolation, which you so much deplore, by enabling the farmer to make his purchases without visiting his neighboring city or village, and would surely result in again filling up our insane asylums from the country precincts, if that condition ever really existed.

I desire to thank you in behalf of the National Retail Hardware Association with its 33 affiliated States and more than 10,000 members for this opportunity of placing ourselves on record against your proposed plan.

I trust you will do the association which I represent the honor of having this letter printed at the expense of the Government, and inclose a copy of the same in each of your communications in the future, in which you inclose copies of letters from those favoring the plan. You can do this with the full assurance that the opposition herein expressed comes from one of the strongest trade organizations of the country; one that has obtained its present high standing on a basis of advocating always those measures that would bring the greatest good to the greatest number.

You can term us selfish if you will, but any legislation that affects my personal business affects equally the business of the more than 1,000,000 retail merchants of the country.

I think this friendly discussion cannot help but result in benefit; but, after all, this question must and will be settled by the men who will make up our next Congress. We believe these men to be too thoroughly in touch with the actual conditions as they exist in this country to-day, to permit any measure of the character of the one you are advocating to become a law.

Yours very truly,
NATIONAL RETAIL HARDWARE ASSOCIATION,
S. R. MILES, President.

NEPTUNE HARDWARE MFG. COMPANY.

THE Marine and Awning Hardware business formerly conducted by the Newhall Ship Chandlery Company has been acquired by the Neptune Hardware Mfg. Company, which has occupied larger quarters for its New York office and warerooms at 54-55 South street. The works at Jersey City, N. J., are being enlarged and improved to meet increasing demand. The affairs of the new company will be managed by the same persons who have successfully built up the business, the officers being as follows: President, J. W. Bancroft; treasurer, J. G. Baumbach and secretary J. J. Giel.

The Hardware, Stove, Paint and Sporting Goods store of Chas. Kotik, Elba, Neb., has been damaged by fire.

PARCELS POST AT THE TRANS-MISSISSIPPI COMMERCIAL CONGRESS.

WHILE not on the formal programme it is understood that the domestic parcels post proposition will come up for discussion at the eighteenth annual session of the Trans-Mississippi Congress, which will be held at Muskogee, Okla., November 19-22. This congress will be largely attended by delegates from a vast section of the country, including Alaska, Arkansas, Arizona, California, Colorado, Idaho, Iowa, Kansas, Minnesota, Montana, Missouri, Nebraska, Nevada, New Mexico, North Dakota, Oklahoma, Oregon, South Dakota, Texas, Utah, Washington and Wyoming. The Travelers' Protective Association and United Commercial Travelers are also represented on the Executive Committee, the former by C. W. Ransom, Portland, Ore., and J. Herbert Stafford, St. Louis, Mo., and the latter by Watt R. Sheldon, Denver, Col. The delegates to the congress are constituted as follows:

The Governor of each State and Territory may appoint 10 delegates and not more than 20 delegates.

The Mayor of each city may appoint one delegate and one additional delegate for each 5000 inhabitants, provided, however, that no city shall have more than 10 delegates.

Each county may appoint one delegate through its executive officer.

Each business organization may appoint one delegate and one additional delegate for every 50 members, provided, however, that no such business organization shall have more than 10 delegates.

Representatives from the Hardware organizations in the section of country covered by the congress are thus entitled to official participation in the deliberations, and it is to be hoped that some of them at least will send delegates with a view to emphasizing in no uncertain manner the opposition of retail interests generally to any measure brought forward in the interest of the establishment of a parcels post in the United States. The retailers of Oklahoma are already alive to the situation and will be heavily represented at the convention for the purpose of preventing any indorsement of the parcels post project, and if possible putting the congress on record as opposed to it. In view of the fact that the National Retail Hardware Association has taken a prominent part in antagonizing this measure, it is not unlikely that it will be officially represented at the gathering.

A MEETING of the Hardware Credit Association was held at the Grand Pacific Hotel, Chicago, on Tuesday, November 5, which was attended by representatives from the leading Western Heavy Hardware jobbers. The gathering was in response to a special call for the purpose of considering questions of credit and other matters relating to conditions growing out of the present stringency of money. It was the general disposition of those present to take a hopeful view of the situation, the belief being expressed that the exercise of sane conservatism and deliberate action would gradually right the present unbalanced condition of affairs.

THE AMERICAN HARDWARE MANUFACTURERS' ASSOCIATION, through its energetic and efficient secretary, F. D. Mitchell, 309 Broadway, New York, is sending out printed copies of the address on the business situation and outlook delivered at the Atlantic City conventions by Frank Baackes, vice-president and general sales agent of the American Steel & Wire Company. Additional copies to any desired number will be furnished on application to Mr. Mitchell.

AT an exhibition of mining and industrial machinery held in Johannesburg, South Africa, several months since, the large display of Myers power pumps, manufactured by F. E. Myers & Bro., Ashland, Ohio, attracted much attention. The Myers exhibit was prepared under the auspices of Geo. North & Son, Durban, Natal, South Africa, and was awarded the first prize gold medal for the best collection of pumps in motion.

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Our Washington Letter.

FROM OUR SPECIAL CORRESPONDENT.

WASHINGTON, D. C., November 12, 1907.

THE announcement widely circulated in the daily press to the effect that the Joint Congressional Postal Commission has decided not to recommend to Congress the authorization of a domestic parcels post will no doubt be received throughout the Hardware trade with much gratification. The statement should not be given undue weight, however, and the exact facts should be understood, in order that the trade may not overestimate the significance of the conclusions reached.

What the Joint Postal Commission Is Charged to Do.

The joint commission, which is composed of the three ranking members of the Post Office Committees of the Senate and House, was appointed to consider purely administrative questions. The act under which the appointments were made directs the commission

> To make an investigation of the entire business system of the Post Office Department and the postal service, including the methods of accounting and expenditure in force in such department and service, with a view to determining what changes or improvements should be instituted in the organization and conduct thereof, and whether a system may not be devised for dealing with the revenues and expenditures of the Post Office Department and the postal service so that the operating expense thereof may be separated and assigned to the various classes of mail matter transported by that service, in such manner as to show the true cost of the transportation, handling and delivery of each class of mail matter and of the various subdivisions of such classes, as well as the true cost of each of the special services rendered the Government and the public by the postal service.

This provision was construed by the commission as embracing merely the business organization and conduct of the postal system and the cost of each form of service rendered. The question as to the advisability of the establishment of a domestic parcels post was not included among the subjects relegated to the commission, and there has been no investigation upon which to predicate any conclusions with reference thereto.

Parcels Post Advocates Turned Down.

During the deliberations of the commission certain interests engaged in advocating a parcels post undertook to bring the matter forward, but the commissioners declined to take it up. Subsequently an attempt was made to inject into the commission's report an indorsement of the project, but this also was firmly resisted. It will be seen, therefore, that the commission has not given consideration to the project, and that the only action taken has been in the nature of a refusal to consider the subject, based upon the fact that the question was not properly before the commission.

The correspondent of *The Iron Age* is in position to state, however, that the personal views of a majority of the joint commission are strongly opposed to a domestic parcels post, but even this statement should not be given too much weight. In the first place, the commission does not embrace a majority of the membership of both Senate and House Post Office Committees. In the second place, both committees will be reorganized when Congress meets and several changes in *personnel* are likely to occur. Finally, the plans of the Post Office Department, which are causing so much anxiety to retail interests, do not include the immediate authorization of a parcels post, but merely certain steps in that direction which are likely to be favored by certain Senators and Congressmen as a sort of compromise proposition unless the retailers of the country can convince them that any legislation involving reductions in the merchandise postage rate or increasing the facilities of the catalogue houses would be exceedingly unwise.

The Postmaster-General's forthcoming annual report will be made public in about a fortnight, and on account of his pronounced views on the subject of a domestic parcels post its appearance will be awaited with unusual interest.

Amending the Sherman Antitrust Law.

The necessity for the amendment of the Sherman antitrust act has been so fully demonstrated during the past year that it is an open secret here that President Roosevelt in his forthcoming annual message will urge Congress to give very serious consideration to this matter. The coincident drastic enforcement of the Sherman law and of the interstate commerce laws, especially the Elkins act, has developed numerous inconsistencies and has worked much hardship in certain directions. While the spirit of the interstate commerce law involves equal rates on similar commodities for equal distances, the Sherman law is held to forbid all agreements as to rates and all forms of pooling. While cut-throat competition is recognized by every business man as most disastrous, agreements to maintain prices are denounced by the Department of Justice as violations of the antitrust law, and within the past six months the country has been treated to the absurd spectacle of a suit by the Federal Government against a handful of retail druggists banded together under an agreement, having for its sole object the maintenance of reasonable prices fixed by manufacturers against the incursions of the big catalogue houses and local price cutters.

The Sherman law has been vigorously denounced by the chairman of the Interstate Commerce Commission as the most demoralizing legislation now on the Federal statute books, and from every part of the country, and especially from so-called independent interests which have found it impossible to protect themselves against the great industrial combinations without rendering themselves liable to prosecution at the hands of the Department of Justice, there has arisen a demand for the amendment of the law along rational lines.

To Be Referred to a Nonpartisan Commission.

It is probable that the first step to be taken in the direction of the amendment of the Sherman act will be the introduction early in the coming session of a measure incorporating the conclusions reached at the conference of the Civic Federation in Chicago a few days ago. This measure will authorize agreements between railroad corporations on reasonable freight and passenger rates, subject in all respects to the supervision and approval of the Interstate Commerce Commission, and will provide for the appointment of a nonpartisan commission to frame a measure amending the Sherman law in the particulars in which it has been found to operate to the disadvantage of legitimate business interests and against the public welfare. The functions of the proposed commission are set forth in a resolution adopted by the Civic Federation, in part as follows:

> This commission, like a similar commission which proved most successful in Germany in 1870, shall consider the entire subject of business and industrial combinations, and report such proposals as to the formation, capitalization, management and regulation of corporations (so far as the same may be subject to Federal jurisdiction) as shall preserve individual initiative, competition and the free exercise of a free contract in all business and industrial relations. Any proposed legislation should also include modification of the prohibition now existing upon combinations on the following subjects:
>
> 1. National and local organizations of labor and their trade agreements with employers relating to wages, hours of labor and conditions of employment.
> 2. Associations made up of farmers, intended to secure a stable and equitable market for the products of the soil, free from fluctuations due to speculation.
> 3. Business and industrial agreements or combinations whose objects are in the public interest, as distinguished from objects determined to be contrary to the public interest.
> 4. Such commission should make a thorough inquiry into the advisability of inaugurating a system of Federal license or incorporation, as a condition for the entrance of certain classes of corporations upon interstate commerce, and also into the relation to the public interest of the purchase by one corporation of the franchises or corporate stock of another.

The plan set forth above will have the support not only of the Civic Federation, but of a large number of important and influential trade organizations, and Congress can hardly fail to realize the strength of the popular demand for this much needed reform. Obviously it is immaterial whether the work of amending the law is delegated to a commission or is assumed by the Judiciary Committee of

the two houses, provided adequate investigation of the subject precedes any attempt at legislation. The commission plan will no doubt prove popular in commercial circles, as it will afford an opportunity for all parties in interest to be heard, and will insure an exhaustive inquiry before Congress takes up the data secured as the basis for the framing of a new law.

DEATH OF JOHN C. KOCH.

JOHN C. KOCH, vice-president of the John Pritzlaff Hardware Company, died at his home in Milwaukee, Wis., Friday evening, November 8, of heart failure, the result largely of an attack of pneumonia three years ago, from the effects of which he never fully recovered. Mr. Koch was born in Germany, October 18, 1841, and came to America when about 13 years old with his parents, who settled in Milwaukee. After a year spent in the Milwaukee public schools he was apprenticed to learn the tinners' trade, at which he worked until 1860, when he

JOHN C. KOCH.

was employed by the firm of John Pritzlaff & Co. In turn he became foreman of the tinshop, manager of the iron department, and in recognition of his industry and ability rose to chief clerk of the house in 1866 and a partnership in the firm a year later. When the business was incorporated in 1884 under the name of the John Pritzlaff Hardware Company Mr. Koch became its vice-president, a post he held until his death. He was also president of the Koch & Loeber Company, wholesalers of Wooden Ware and Specialties.

Mr. Koch was well known to the Hardware fraternity throughout the United States, and had always taken an active interest in the various Hardware associations, serving on the executive boards of several of them and having been vice-president of the National Hardware Association for several terms. While greatly interested in all that pertained to good government, Mr. Koch held but one political office, that of Mayor of Milwaukee for two terms, 1893-1896, inclusive, although he was the Republican candidate for Lieutenant-Governor of Wisconsin in 1892, and in 1894 was asked to accept a nomination for the office of Governor at a time when the nomination was considered the equivalent of an election.

Mr. Koch was also active in the councils of the Evangelical Lutheran Church, and prominently identified with some of its educational institutions, contributing generously of both time and money to their advancement and support. He was one of the trustees of Concordia College, belonging to the Lutheran denomination, and much of its present prosperity is attributed to his business foresight and administrative qualities, he having on frequent occasions assisted it financially, at times carrying some of its obligations without interest and advancing large sums for securing needed real estate. Largely through his influence and financial support the Lutheran Home for the Aged was organized last year for the care of old people connected with the Lutheran denomination. Early in life he had become associated with Trinity Evangelical Lutheran Church, and was one of its vestrymen for years.

Mr. Koch at one time was president of the Milwaukee Exposition and long a director of the Concordia Fire Insurance Company, a member of the Old Settlers, the Deutscher and Calumet clubs, and of many German societies. In 1864 he was married to Miss Elizabeth Pritzlaff, eldest daughter of John Pritzlaff, and is survived by his widow, seven sons and two daughters, all of whom were with him at the end.

THE CANADIAN HARDWARE TRADE.

FROM A SPECIAL CORRESPONDENT.

THOUGH general trade conditions in this country are less favorable than they were a year ago, the Hardware business is not yet experiencing any marked reaction. House building, it is true, has had a check, the result of money stringency. Loan and mortgage companies have all their available funds in use, and it is now extremely difficult to obtain money for building operations even on the best real estate security. Of course, the decline in building activity means a contraction of the demand for Builders' Hardware. It is to be remembered, however, that the erection of dwellings, office blocks, factories, stores, warehouses, &c., has been going on at an extraordinary rate in the cities and towns of this country. There might be even a greater abatement of the demand on this account without producing dullness in the branch of the Hardware trade concerned. Banks and loan companies are now husbanding their resources, and there is good reason to believe that in a few months at the utmost we shall have comparatively easy money again. Some of those most competent to speak on the outlook have recently let their views be known.

In an interview published in a Toronto morning paper a leading wholesale Hardwareman of that city expressed himself to the effect that collections were no doubt harder to make this year than last, and that trade is not so good. He said that his house had been more cautious in pushing business, and especially in opening new credits. There had been a curtailment of credit both on the part of the wholesale and retail trade. He thought it would have a wholesome effect if business were put more on a cash basis and a check given to speculation in real estate.

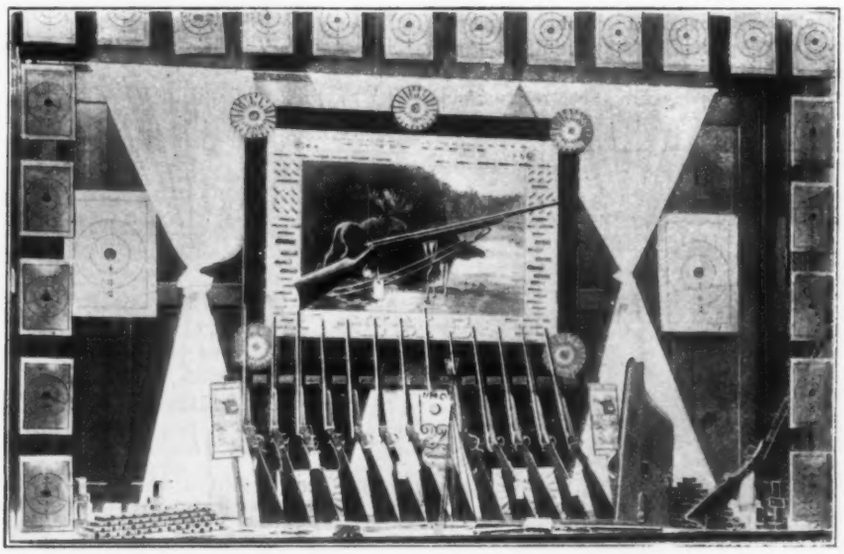
Another prominent wholesaler of Hardware in Toronto said that business was keeping up well, but that they were discouraging anything in the way of speculative investment on the part of their customers, and urging them to keep their credit well in hand and have patrons pay promptly. He said that there had been few and unimportant failures during the year in the Hardware trade, and he regarded the outlook as favorable for a healthy trade during the coming year.

Concerning the monetary conditions, the manager of the Canadian Bank of Commerce, Montreal, spoke very encouragingly at the banquet, given at the close of the ninth annual convention of the Canadian Wholesale Hardware Association, recently held in that city. He said that while it was true that there was no money to lend for stock or real estate speculation he had yet to hear of a single instance from Halifax to Vancouver where a merchant or manufacturer entitled to credit could not get all the money he was entitled to for the prosecution of his business.

THE CALDWELL LAWN MOWER COMPANY, Newburgh, N. Y., has been awarded a diploma and gold medal by the Jamestown Exposition. The company's Hand, Horse and Motor Lawn Mowers are covered by the awards.

GUNS AND CUTLERY EFFECTIVELY SHOWN.

E. G. KOENIG, Newark, N. J., whose enterprising and up to date business methods have been previously referred to in our columns, has furnished us photographs of two timely window displays recently installed by him. The photographs are excellent ones, taken by Mr. Koenig himself, who conducts one of the largest and best equipped photo supply and finishing departments in the State. The windows will also be found highly suggestive to our readers, as they contain ideas which may readily be adapted to the use of other merchants.



Gun Window Display of E. G. Koenig, Newark, N. J.

The Koenig store occupies a prominent corner on Broad street, Newark, and enjoys the advantage of some large side windows beside the two front windows that flank the entrance. Two of these side windows are reproduced as they were dressed simultaneously, from which the reader may judge how prominent and attractive the store is constantly made to passers by. It will be observed that the windows are enclosed with panel backs, so that they do not interfere with the wall space and counter displays on the inside. The facilities for lighting are excellent.

The Gun Window.

was especially timely, appearing as it did at the beginning of the open season, as shown by a game card advertising circular issued by the firm which we have already reproduced. Particularly striking and original is the use of the Targets which form a sort of border around the window frame with two extra large ones occupying a prominent place on the back wall. Bunting is also used in the background as a setting for one of the large U. M. C. game pictures. Suspended in the center of the window at an exceedingly natural angle is a handsome Gun. It hangs by cords attached, one at the breech and the other 3 or 4 in. from the muzzle. Underneath are a dozen pieces standing in a rack, which displays them to excellent advantage, side to. A stack of Cleaning Rods stands in the foreground and Shells and Cartridges, loose and in boxes, Gun Cases and other paraphernalia are effectively included in the arrangement.

The Cutlery Window.

is hardly less attractive in its way than the Gun window. Here the feature is the firm's own special brand of Razor offered at $1, with a 30 days' trial free. Bunting is used for the floor and background, thus corresponding with the adjoining window already described. Other kinds of Razors, including Safety Razors, are also well displayed. Strops are arranged in 25 and 50 cent groups hanging on brass rods suspended by the ceiling. Soap, Brushes and other shaving accessories are attractively grouped and marked. The Cutlery line is further represented by some Carving Sets in boxes at the right hand side of the window, and a variety of Shears hung from the ceiling on cords, clearly shown in the illustration.

Cutlery and Related Goods Window Exhibit of E. G. Koenig, Newark, N. J.

Mr. Koenig believes that he is amply repaid for the time, thought and expense devoted to his windows. Attractive displays are installed at all times, changed frequently, and results are studied with the greatest care.

Holiday Trade in The Hardware Store.

Second Article

FOSTER BROS.' CHRISTMAS CAMPAIGN.

WE reproduce herewith several selections from a multitude of advertisements used by Foster Bros., Northampton, Mass., during the three or four weeks preceding last Christmas. This firm occupies a stand which has been the seat of a Hardware business for over 47 years, with the exception of one year. Foster Bros. succeeded to the business in 1902, and the Christmas trade done by the firm last December showed an increase of 50 per cent. over that of December four years previously. The business for the whole year of 1906 showed an increase of about the same percentage over that done by the firm's predecessors in 1902. A good share of the success which has attended the business as now managed is attributed to newspaper advertising.

Christmas Suggestions.—Actual Size, 10 In., Two Col.

Some of the best selling articles through the month of December we find are Pocket Knives, Carvers, Razors of various kinds, the Universal line of goods, Sleds and Skates, and Scissors and Shears. In all these lines we have done exceptionally well. On Pocket Knives we kept a very close record and found that during December last we sold 406; also over 25 sets of Carvers, several dozen Food Choppers, 1¼ dozen Bread Makers, 15 Gillette Safety Razors and over 2 dozen Razors. Last year we also added a small line of Mechanical Toys, and these proved to be very good sellers. As an experiment we bought a bill of these Toys amounting to $71, and on taking inventory at the beginning of 1907 we found that we had less than $11 worth left. As a starter we consider this doing well. We might also add that during the two days before Christmas—that is, December 22 and 24—we waited on over 1000 cash customers.

Best Selling Articles.

Venture in Mechanical Toys.

Two Days' Record.

The
"UNIVERSAL"
Household Specialties
Not only contribute to the purity and goodness of every meal, but just think of the time and labor saved by their use.
The "Universal" Bread Maker is a pail, made of heavy tin, with a kneading rod, which mixes and knads the dough in three minutes, done thoroughly than you could ever do it by hand. Saves 20 to 30 minutes of tedious, tiresome labor every bread day. No tired back and aching arms—your hands never touch the dough. No mess—no fuss. Bread always the same—light, wholesome and nutritious. Price $2.00.
The "Universal" Coffee Percolator makes the best coffee, and quickly, because the automatic valve forces the water through the coffee as it gradually increases in temperature. By the time the boiling point is reached the coffee is ready to serve—pure, wholesome, delicious—because it has not been boiled. Rich in strength and aroma, for they have not been lost in steam. Aluminum and "Elite" enamel ware—different styles and sizes. $2.50 up.
The "Universal" Food Chopper enables you to utilize the untouched portions of cooked and uncooked food that might otherwise be wasted if you were confined to the use of the tiresome chopping bowl. Chops anything you want chopped—easily, quickly and well. Three cutters—fine, coarse, medium, and nut butter grinder. One or two crushes run through the machine after using cleans it thoroughly. No holes or openings to become clogged. All parts exposed to view.
Three Very Useful and Appropriate Articles for Holiday Gifts
FOSTER BROS.

The Universal Line.—Actual Size, 5½ In., Two Col.

GET THE BOY A KNIFE for XMAS
We doubt if there is a boy in this whole wide country who at some time or other has not wished for a knife.
He will swap or sell anything in order to get a knife. We know that boys like knives because we've watched them as they gaze into our show windows, looking as though they almost wished they could draw the knives right through the window.
We've knives of all kinds, with good steel blades and handles in pearl, ivory, shell, wood, rubber or stag. Price from 10c to $3.
Foster Brothers.
Tel. 11 102 Main St.
Open Monday, Friday and Saturday evenings.

Pocket Cutlery.—Actual Size, 4½ In., Two Col.

LETTERS FROM HARDWARE MERCHANTS.

We give below extracts from letters of a number of representative merchants giving some account of their holiday trade methods, which will doubtless be of special interest to our readers at this time:

Attracts Many New Faces to the Store.

FROM A MERCHANT IN ALABAMA: We have for the past five years handled a complete line of both light and large Toys, such as Dolls, &c., in the lighter Toys, and Boys' Wagons, Velocipedes, Hand Cars, &c., in the heavier goods, besides the line of Fireworks, Silver Plate Goods, Brass Fire Sets and such goods as find a ready market at that time of the year. As for results, we find same very satisfactory, especially in the heavier goods and fancy stuff, but for the lighter ones we have determined to discontinue the sale of same, as we find that so much of it is broken and stolen during the rush it can hardly bear much net profit. We consider the sale of goods referred to above quite worth the expense and trouble we are put to, even if we did not make anything at all, as we get people into the store that we never saw before and then make many good customers; but we do make something, and a very nice profit, too. Having handled such goods for five years we do

Light Goods Discontinued.

Making Customers.

not have to put forth much effort to get the trade, as we are known as people who handle them.

Last Season's Business Very Satisfactory.

FROM A MERCHANT IN WISCONSIN: We have for several years made special efforts toward this trade, and the past season's Christmas business was the best we have ever had. In our regular business we pay particular attention to our side lines, and just before Christmas we bring them to the front and make special displays of such goods particularly suitable for Christmas presents, in their different departments.

Side Lines to the Front.

Our salesroom is 55 x 100 ft., which gives us three large show windows, and we try to use these to good advantage in showing up such goods as Plated Ware, Carvers, Nickel Plated Ware, Suit Cases and Grips, Sporting Goods, Kodaks, Cutlery, Sleds, Skates, Skis, &c. These lines are a very valuable addition to Hardware, and the sales on them are very satisfactory. They are all nice clean goods to handle and the clerks take an interest in selling them. In connection with making a good show in the store and windows we also use extra advertising space in our daily papers, which we find brings good results.

Clerks Interested.

Campaign Begins Three Weeks Before Christmas.

FROM A MERCHANT IN ILLINOIS: We buy a few hundred dollars' worth of imported and domestic Toys and offer them for sale for about three weeks before Christmas, and whatever are left we tie up tight and pack away until the next year. This seems to be the best means of attracting customers at Christmas time and insures our getting trade on the regular goods, such as Pocket Knives, Skates, Iron Wagons, Nickel Plated and Aluminum Ware, Carvers, &c.

Toys as Attraction.

Price Range from 25 Cents to $12.

FROM A MERCHANT IN WISCONSIN: In regard to our holiday trade, we find it quite an item of profit and prepare for it in the early fall by making selections of such goods as are likely to be called for in this locality during the holidays. We have two large windows, one of which we devote to Sporting Goods, the other to Plated Ware and Carving Sets. These items we arrange in an attractive form and then put price cards in large, plain figures on each item, ranging in price from 25 cents to $12. By this method we found a great many sales were made on the outside of the window. We also found that the more expensive articles sold themselves, and we had the best holiday trade the past year we have had since being in business.

Windows Featured.

Results of Experience.

FROM A MERCHANT IN NEBRASKA: We have been through the mill in this line of work quite a number of times, and find that the handling of holiday goods is profitable if confined to articles naturally belonging to the fancy metal line. But we would never advise a retail Hardware store to enter into that class of trade. By this we mean a full line of toys, fancy celluloid goods and novelties of that indiscriminate nature that we have found to be a tremendous aggravation to our regular Hardware work. We have found that regular goods in a measure have to suffer at the expense of the Christmas articles, and we have therefore cut out that portion after substantial trials. We have been obliged to move a large number of Stoves and heavy articles to make room for pyramid displays of the Toys, &c., which we have since found was not doing justice to the regular line of work that we are engaged in. During the last holiday season we have replenished our stock with many lines of a Christmas nature, such as Nickel Plated Ware, Coffee Urns, Percolators, Silverware, Fancy Clocks and such like. This we have found more in the keeping with the dignity of a Hardware store, and the results have been surprisingly satisfactory.

Stick to Hardware Lines.

Holiday Hardware an Extensive Line.

FROM A PENNSYLVANIA MERCHANT: We have during the past few years made quite an effort in this direction with very satisfactory results. We confine our efforts largely to the legitimate Hardware lines, but exploit to the very best advantage those goods which are particularly adapted for holiday presents. This is not now a small line by any means. In addition to the attractice displays that can be made of Cutlery of all sorts, there is now such a large line of handsome Nickel Cooking Utensils and Table Ware that a very effective display can be made. Then Sleigh Bells, Robes, Skates, Sleds, &c., if properly handled, make as complete a line of useful holiday gifts as can be had outside of a department store.

Line Is Extensive.

In our advertising, we make much of the point that our lines are useful gifts, and endeavor to direct the buyer's attention away from buying the useless, gaudy things which are so much in evidence at holiday time. Our window displays are made particularly attractive, and there has been much favorable comment on them and we believe have been the best and most essential of our holiday advertising.

Emphasis on Useful Gifts.

WEAVER, PALMER & RICHMOND'S NEW STORE.

THE city of Rochester, N. Y., now boasts the possession of one of the finest retail Hardware stores in the United States, that of Weaver, Palmer & Richmond, a firm which was organized in 1886, incorporated in 1901, and which for many years did a retail and wholesale business on Main street, East. The steady growth of the business made larger quarters necessary, and in April last the company moved into a large block at 13, 15, 17 Exchange street, 48 ft. front, 165 ft. deep, five stories in hight with a store floor 15 ft. high. The entire building has been remodeled and refitted to suit the demands of the business.

The ground floor is fitted entire with the Warren patent glass front drawer and sectional shelving from floor to ceiling, and is devoted to the retail business, being also used as a complete sample room for the wholesale trade. On the next floor above are the general offices, a large and elegantly appointed Builders' Hardware room 34 x 16 ft., fitted with sliding easel sample boards protected by plate glass doors, large sample tables, easy chairs and large Davenport for the comfort and convenience of architects and customers. On this floor is also located the House Furnishing Goods department accessible by passenger elevator from the store floor. The floors above are used for shipping and receiving departments and for wholesale stock. The entire establishment presents to the visitor an air of neatness and order too seldom seen in a Hardware store.

THE plant of the Utica Drop Forge & Tool Company, Utica, N. Y., manufacturer of Nippers, Pliers and Fencing Tools, which was burned to the ground on June 25 last, has been entirely rebuilt and machinery is now being installed and operations will be resumed early in December. While the fire was most unfortunate, it has provided an opportunity, which the officers of the company have taken, of constructing a modern, up to date building of the saw tooth design, that is well lighted and ventilated, and especially planned for the manufacture of Nippers and Pliers. This new building has twice the area of the one destroyed, so as to provide for the steady increase that the company's business has shown from year to year. The special uses of the various tools made by the company are illustrated and described in a unique and original manner in its catalogue lately issued, entitled "Plier Palmistry," copies of which will be furnished to all interested.

SHORTER TERMS ON AGRICULTURAL MACHINERY AND VEHICLES.

FOR several years there has been considerable agitation on the part of some manufacturers favoring shorter terms on Agricultural Machinery and Vehicles. This agitation has increased during the past few months and resulted in a meeting of manufacturers in Chicago November 5, at which 40 of the largest and most important manufacturers were represented. The National Federation of Retail Implement Dealers was also represented by its president and vice-president. The meeting resulted in the recommendation that all manufacturers adopt the following terms:

PLOWS, DISK HARROWS AND KINDRED LINES.—Maturities to be advanced to dates now given as cash discount dates. Cash discount, 1 per cent. per month, with a maximum of five months; additional prepayment to take discount at the rate of 8 per cent. per annum; interest at highest legal rate for deferred payments. To take effect on sales for fall business of 1908, with an immediate advance of one month in maturities of sales yet to be made for spring business of 1908.

SEEDERS AND GRAIN DRILLS.—Machines sold for spring trade to be due July 1. Machines sold for fall trade to be due December 1. Cash discount 1 per cent. per month; interest at highest legal rate on deferred payments; monthly settlement of balances by cash or note. Effective on fall business of 1908; immediate advance of one month in maturities of sales yet to be made for the spring business of 1908.

WINDMILLS.—All bills 60 days, less 2 per cent. for cash in 10 days.

HAY RAKES, LOADERS AND TEDDERS.—Date of maturity August 1. Cash discount of 1¼ per cent. per month, with a maximum of 5 per cent; interest at highest legal rate on deferred payments. Effective on 1909 business.

POTATO MACHINES.—Planters, August 1; cash discount 1 per cent. per month. Sprayers, four months; cash discount 5 per cent. 30 days. Diggers and Sorters, three months; cash discount 3 per cent. 30 days.

LAND ROLLERS.—Ninety days from March 1, less 3 per cent 30 days.

CARRIAGES AND BUGGIES.—Four months, less 5 per cent. 30 days. April 1 dating on goods sold after November 1.

FARM WAGONS.—No advance datings; terms six months. There was no recommendation as to cash discount.

Those present at the meeting unanimously agreed that a change in terms had become an absolute necessity. There was, however, no attempt to secure an agreement on terms. The recommendations regarding the various lines were made by committees consisting of the manufacturers of those lines present, so that the terms of each line was considered by those vitally interested. For these reasons they will probably be acceptable to at least a majority of manufacturers of similar lines.

The representatives of the National Dealers' Federation admitted that conditions justified manufacturers in considering shorter terms, but opposed an immediate change. They believe that merchants should have an opportunity of gradually educating the farmer to a change, and that the entire question should be agitated throughout the dealers' organizations.

The terms named are simply recommendations, which may or may not be carried into effect, as the various manufacturers elect. Now that the agitation has assumed definite shape, there should be no hesitation on the part of all interested in the attempt to bring about more reasonable conditions. Terms and discounts on all materials are being constantly reduced, and manufacturers cannot be expected to continue terms that have got beyond safe business principles.

Another feature which is being favorably discussed, but which did not appear in the recommendations adopted at the meeting, is to require the giving of notes at the time of invoice. This is considered important, as a means of more rapidly educating merchants to protect themselves by requiring note settlements from their customers upon delivery of the goods.

The most active agitators for a change in terms maintain that the present period of great prosperity among the farmers is a fortunate time to select for discontinuing excessive terms. They argue that conditions should not be such that the Implement or Vehicle manufacturer is expected to play the part of banker for the farmer, but that the farmer should either arrange his finances to purchase on nearer a cash basis or actually ask the assistance of his local bank.

Merchants and manufacturers both agree that the adoption of terms similar to those recommended would eliminate many irresponsible dealers, who are a source of loss generally to both the manufacturer and regular merchant.

AMERICAN STEEL & WIRE COMPANY ON THE BUSINESS OUTLOOK.

FRANK BAACKES, vice-president and general sales agent of the American Steel & Wire Company, has sent a circular letter to assistants, managers of departments and traveling representatives containing forceful instructions not to cut schedule prices under any conditions. The letter appears to voice the sentiments of the independent Wire manufacturers as well as the greater corporation; they have seen the letter and believe that the carrying out of its instructions should have a most beneficial influence on trade. The letter is as follows:

The financial crisis now upon us and through which we are now passing will be very strenuous upon all business men, and no one can prognosticate how far reaching it will be or where it will end. In consequence more or less recession in business is bound to take place; in fact, the very action of the banks throughout the country almost forces a recession. There is no reason, however, to be pessimistic or hysterical. This is the time for common sense and conservatism, and the purpose of this letter is to advise you that we are not at all alarmed and that this crisis will pass; in our opinion the country is so prosperous that our particular line will not be affected very much. We feel confident that as the United States Steel Corporation was strong enough in times of prosperity to prevent an undue inflation of prices, it is strong enough now to prevent an undue slump. That fluctuations to a greater or less extent will take place in the different lines is probable, but our merchant friends should not feel that they are sitting on a volcano when they look at their stock of merchandise, bought at prices ruling during the past year. Those prices were not inflated, thanks to the existence of the Steel Corporation.

My instructions to you are, indulge in no cutting of any kind: maintain schedule prices absolutely. This is no time to think of anything else. No additional sales would result from a drop of any kind, and I want to emphasize the point that you are not to sell the trade any more goods than they can take in and pay for. If this is not sufficient to take care of our production the goods will not be manufactured.

To all of our friends and customers who desire an expression from you, I want you to convey the above opinion and instructions.

MISCELLANEOUS NOTES.

The Delta Special Files.

The Delta special line of files comprises a new line of hand files for saw filing, adapted particularly for carpenters' and family use, which is now being placed before the trade by the Carver File Company, Philadelphia, Pa. The files are of the small three square type, but without taper, and range in length from 4½ to 6 in., the 5 and 6 in. sizes being the most popular. They are made of the best English crucible steel, and have a blunt end. They are packed 12 in a neat box, with four wooden handles, so that it is unnecessary to buy extra handles as is the usual custom. For household purposes these files are particularly useful, being adapted to a great variety of work.

Embroidery Hoops.

The Reinhart Varieties Company, Canton, Ohio, is offering a line of embroidery hoops fitted with a patent spring, the feature of which is that the center of the spring presses against the cut ends of the hoop. This pre-

vents them from spreading outward. The spring allows the hoop to accommodate itself to the thickness of the fabric that is being embroidered. Two styles are made, the round, which range from 4 to 12 in. in diameter, and the oval, which come in 3 x 6, 4½ x 9 and 6 x 12 in. sizes.

A New "Kingfisher" Fishline.

E. J. Martin's Sons, Rockville, Conn., have brought out an addition to their Kingfisher brand of fishlines, the new line to be called the Chester. It is an extremely hard braided casting line, designed to combine strength with minimum size. It is made of a specially prepared Japanese silk, braided hard and close to prevent water soaking, and is intended to meet the demands of those wishing an undressed line. It is particularly well suited for lake fishing where large fish are likely to be caught, as it will stand an unusually strong pull. It is put up on two spools, 50 yds. on each, the two being connected.

Fruit Jar Wrench.

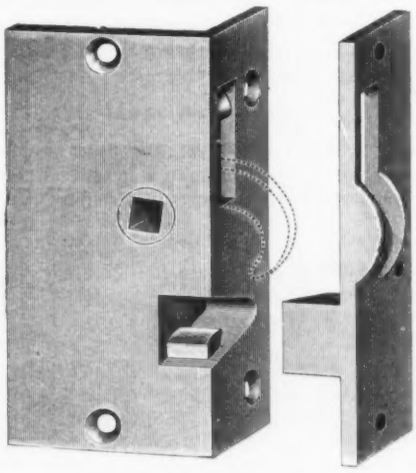
The accompanying illustration represents a fruit jar wrench, put on the market by the Parker Wire Goods Company, Worcester, Mass. The wrench is constructed so that the binding wire encircles the top of the jar or can, fitting into the groove. Both ends of the binding

Fruit Jar Wrench.

wire are fastened to the handle, one end with a swivel and the other end having an eye turned on it, which fastens onto the handle loosely. By pressing the handle forward the loose eye on the binder slides up on the handle toward the other end of the binder, and thus grips the can top. The illustration shows the wrench in a position to unscrew the cover. To tighten the cover the wrench is turned over.

Automatic Safety Hook Lock.

Jos. N. Smith & Co., Detroit, Mich., have brought into the market a new feature in an automobile tonneau door lock, which is said to work on an original plan. They



Automobile Tonneau Door Lock.

have combined a guide to prevent any sagging of the door, with their lock so that the door is always brought to its proper place, and the lock is so constructed that the engaging part of the guide, which is a part of the lock striker and is fastened to the door post, comes in contact with the working part of the lock when closing the door. When the door is closed it instantly releases the mechanism, and a hook is thrown out into the slot of or opening in the lock striker, which not only locks the door, but also has a drawing tendency on the door post. The construction is such that when the door is open the lock holds the engaging hook within itself, leaving no projection from the lock whatever. When the door is shut the projection extends into the striker, locking the door and binding the door firmly to the door post. The case and strikers are made of refined malleable iron and the hook and dog of refined steel, while the springs are of bronze. The parts are all machined to templates and are interchangeable. The locks are said to be easy to fit, as the parts to be cut out in fitting are so uniform in shape that the work is reduced to a minimum. The hook is made with a slight taper and in closing enters a tapering pocket, thus preventing rattling.

Improved Air Moistener.

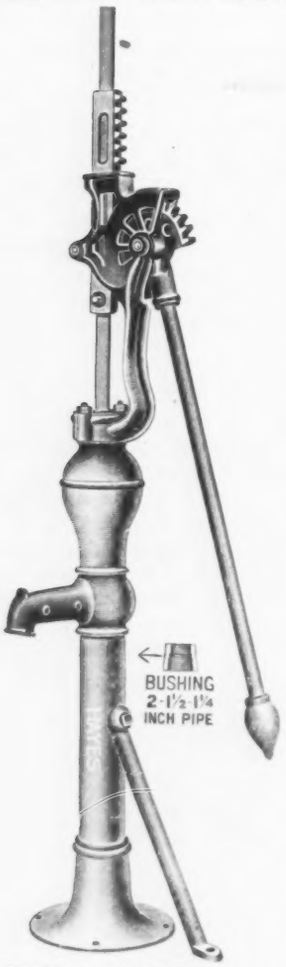
The improved Faye air moistener, herewith illustrated, is being offered by the Orr & Lockett Hardware Company, Chicago, Ill., which controls the patents under which it is manufactured. This device is designed for attachment to radiators for the moistening of air in buildings heated by steam or hot water. As originally constructed, the moistener consisted simply of a galvanized water tank with a perforated lid to admit evaporation of the water. This was effective in a degree, but in order to provide more rapid evaporation the improved moistener is fitted with an open frame top from which a sheet of crash toweling or other absorbent material is

Improved Air Moistener.

suspended into the water contained in the main body of the tank. In this way a greater surface of moisture is brought in contact with the air and the evaporation largely increased. By means of hooks attached to the sides of the tank the moistener is hung on the inside of the radiator next to the wall and out of sight. These hooks are adjustable, and when the apparatus is not in use it may be folded closely against the sides for convenience in storage. The desirability of effective means for moistening the air in steam heated buildings is plain, since the air in the average radiator heated room is entirely too dry for health or comfort. It is estimated that one moistener will provide sufficient humidity for each 3000 cu. ft. of air in an apartment. In a booklet issued by the Orr & Lockett Hardware Company, distinguished as No. 1000, some interesting data relative to atmospheric humidity and its hygienic effects are given. The booklet will be sent to merchants upon application.

The Hayes Ratchet Top Pump.

Hayes Pump & Planter Company, Galva, Ill., is offering the new ratchet top pump illustrated herewith. The cog gear leverage, it is explained, increases the power and causes the pump to work easily in deep wells. The ratchet slide works against a roller bearing to reduce friction to a minimum. The long steel handle, with weighted end, may be increased in length for deeper wells by the insertion of a longer pipe. While most advantageous as a hand pump, it is remarked that the pump is readily adapted to windmill use, since by removing the rod pin the windmill rod is left free to work within the ratchet slide. This style of top is also furnished on force cast standards, branch pipe and special tubular well pumps. All parts are numbered, which facilitates ordering repairs The pump is tapped at the spout for 2-in. pipe, and is furnished with a combination bushing, tapped for 1½ and 1¼ in. pipe. This feature enables merchants to fill orders for different size tappings, with one pump, a convenient and economical arrangement, which will doubtless be appreciated by the trade.



The Hayes Ratchet Top Pump.

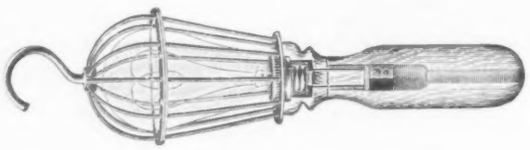
New Adjustable Size Block or Packing Gauge.

The adjustable size block or packing gauge shown in the illustration is a new type of mechanics' tool designed for use with planer, milling machine, boring mill and lathe, and, with other machine tools, its special purpose being to procure accurate adjustment of the cutting tool, where a packing is to be planed into a lathe rest, planer head, saddle or any of the many other places where inside packing is used. The taper base has on its upper surface a 60-degree dovetailed slot, in which are movable for its whole length the step piece and the adjusting nut bracket. The step piece is broached out to contain the clamping nut, under which is a spring washer to give the necessary slight friction. The adjusting nut bracket carries a clamping nut with spiral spring inside to give the friction. The adjusting screw is fastened to the step piece, the adjusting nut working upon it. By tightening the clamping nut of the bracket and loosening that of the step piece the adjusting nut can be used for procuring fine adjustments, one turn of the nut giving a vertical movement of 5-1000 in. By loosening both clamping nuts the step piece may be moved instantly to any position on the base. If a packing is to be planed into a part the required hight of the cutting tool may be obtained on the first chip. A second trial is unnecessary, nor is it possible to take off too much metal and spoil the work. In setting two roughing heads in a double head planer much time wasted in running the saddle back and forth for the adjustment of the second tool may be saved by the use of the size block. If the work is higher than the range of the block it is placed on a parallel. If a number of pieces of one thickness are to be planed separately, and, as often happens, the size is odd, or the pieces too high for standard size blocks, the adjustable size block, placed on a parallel of sufficient hight, will accomplish the desired adjustment of the tool. If a piece is to be bored out to some odd measurement and must leave the mill accurately sized, the gauge is set to the desired distance from table to boring bar, the machine is set so that the gauge just slides under the bar and the result must be correct. In setting straddle milling cutters for any required distance apart on small work the tool is convenient. Lathe hands find it useful where they have much squaring to do for accurate inside measurements in narrow places. The range of adjustment by movement of the dovetailed slot is from 3-16 in., the smallest, to 1½ in., though, as already stated, the scope of the tool may be increased indefinitely by the use of parallels. It will be seen that all the adjusting parts are below the top surface. All important surfaces are ground, and the step piece is hardened and ground parallel with the bottom surface. The tool is manufactured by the Tip Top Tool Company, 78 Vernon street, Worcester, Mass.

A New Adjustable Size Block or Packing Gauge.

Standard Portable Lamp Guard.

The Standard Electric & Chemical Company, 224 South Clinton street, Chicago, is offering the portable electric lamp guard herewith illustrated, which is designed especially for use about shops, offices, warehouses and wherever a portable light is needed. A special feature of the guard is the heavy flat steel ring which supports the wires. This is made strong enough to withstand severe pressure and securely guards the lamp against shocks that would otherwise cause breakage. For the insertion of the bulb the top is made easily removable. The handle is of wood, and is thoroughly insulated. The largest size, which is 14 in. in length, weighs 14 ounces. A hook in the end is provided for convenience in suspending the lamp as occasion may require. A smaller size designated as style "A" Auto, designed especially for automobile use, is also made. It can be used in connection with any battery, and carries a 4 candle power lamp of low voltage.



Standard Portable Lamp Guard.

Shipman & Allen, Winooski, Vt., have been succeeded by Tuttle & Allen, Mr. Shipman having sold his interest in the business to S. B. Tuttle, formerly salesman for Holton Hardware Company, Burlington, and lately for Harrison Bros., Philadelphia.

Adoue-Blaine Hardware Company has succeeded Fuller-Cook Hardware Company, Houston, Texas, and will carry on a wholesale business in House Furnishings, Stoves, Implements, Builders' Hardware, Sporting Goods, Tinware, &c.

The Akron Eclipse Level No. 28.

The Baker, McMillen Company, Akron, Ohio, is offering the new level shown in the accompanying illustration. It is solid cherry 1 in. thick and 2½ in. wide, 42 in. long, made from selected stock and highly polished. The tool contains four plumbs and two levels, so it can be used either end up, and always have two plumbs in view.

The Akron Eclipse Level No. 28.

Cement Workers' Tools.

The accompanying illustrations relate to tools adapted particularly to pavement work, recently added to the line of cement workers' tools, manufactured by John Stortz & Son, 210-212 Vine street, Philadelphia, Pa. Fig. 1 shows an iron indentation or dot roller, which is similar in every respect to the bronze rollers of this type, but is made to meet the demand for a cheaper roller. While this roller is first class for its purpose, the manufacturers caution the user to clean and oil the tool thoroughly after using to prevent rusting, which would cause it to hang or drag the indentation. The roller is made in two sizes, 6 and 7 in. long, the indentations being 3-16 and ½ in., respectively, from centers. In Fig. 2 is shown a bronze roller jointer or groover, made on the same principles as the Dot roller. This tool makes a very neat joint, and runs freely on ordinary bearings. The wheels are 4 in. in diameter, and can be furnished with a fine joint for use on pavement work, or with wide grooves for stable work. Jointer I, illustrated in Fig. 3, is a tool with one straight end and one curved end, particularly adaptable for use in joint work in corners and around framework. It is furnished either in bronze or iron, and is 7½ in. long with a ½-in. web. The handle is of maple, and is held firmly in position by means of a lug cast on the inside frame of the tool.

Fig. 1.—Iron Indentation or Dot Roller.

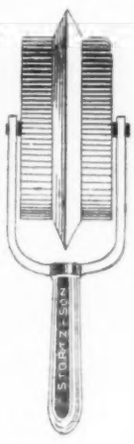


Fig. 2.—Bronze Roller Jointer or Groover.

Fig. 3.—Jointer I.

The J. Stevens Arms & Tool Company, Chicopee Falls, Mass., does much to assist the trade in selling its line. Practical advertising accessories recently issued include handy abridged catalogues which can be inclosed in ordinary letter envelopes or distributed from the counter. They cover all the company's staple numbers as well as the latest addition to its extensive and varied output. Stout part envelopes are also offered which are especially designed for sending small articles through the mail, such as component parts of firearms, &c. To merchants willing to pay transportation charges, a liberal quantity of the abridged catalogues and part envelopes will be furnished with imprinted firm name and address.

PAINTS, OILS AND COLORS

Animal, Fish and Vegetable Oils—

	₱ gal.
Linseed, Western, raw	.46 @47
City, Boiled	.49 @50
City, Raw	.48 @49
Raw, Calcutta, in bbls	.70 @..
Lard, Extra Prime, Winter	.74 @77
Extra No. 1	.53 @56
No. 1	.49 @52
Cotton-seed, Crude, f.o.b. mills	.24 @25
Summer Yellow, Prime	.35½@35¾
Summer White	@39
Yellow Winter	@42
Sperm, Crude	.59 @60
Natural Winter	.70 @72
Bleached Winter	.74 @76
Bleached Winter, Extra	@..
Tallow, Prime	.61 @63
Whale, Crude	.35 @36
Natural Winter	.46 @48
Bleached Winter	.49 @51
Extra Bleached Winter	.51 @53
Menhaden, Brown, Strained	.41 @42
Light Strained	.41 @42
Northern	@..
Southern	@..

	₱ lb
Cocoanut, Ceylon	7¾@ 8
Cochin	9¾@10
Cod, Domestic, Prime	.41 @42
Newfoundland	.42 @43
Red, Elaine	.46 @49
Saponified	6¾@ 7
Olive, Yellow	.75 @80
Neatsfoot, Prime	.58 @60
Palm, Lagos	6¾@ 7⅛

Mineral Oils—

	₱ gal.
Black, 29 gravity, 25@30 cold test	.13 @13½
29 gravity, 15 cold test	.13½@14
Summer	.12½@13
Cylinder, light filtered	.20½@21
Dark, filtered	.18 @19
Paraffine, 903-907 sp. gravity	.14½@15
903 sp. gravity	.13½@14
883 sp. gravity	.11 @11½
Red	.13½@14

Miscellaneous—

Barytes:	
White, Foreign	₱ ton $18.50@20.50
Amer. floated	₱ ton 19.00@20.00
Off color	₱ ton 13.00@16.50
Chalk, in bulk	₱ ton 3.00@ 5.25
In bbls	₱ 100 lb .@ .35
China Clay, Imported	₱ ton 11.00@17.50
Cobalt, Oxide	₱ 100 lb 2.50@ 2.60
Whiting, Commercial	₱ 100 lb .43@ .52
Gilders	₱ 100 lb .55@ .65
Ex. Gilders	₱ 100 lb .60@ .65

Putty, Commercial—₱ 100 lb

In bladders	$1.70 @1.85
In bbls, or tubs	1.20 @1.45
In 1 lb to 5 lb cans	2.65 @2.95
In 12½ to 50 lb cans	1.50 @1.90

Spirits Turpentine—₱ gal.

In Oil bbls	49½@50
In machine bbls	.50 @50½

Glue—

	₱ lb
Cabinet	.12 @15
Common Bone	.7½@ 9
Extra White	.18 @24
Foot Stock, White	.12 @14
Foot Stock, Brown	.9 @11
German Hide	.12 @18
French	.10 @40
Irish	.13 @16
Low Grade	.10 @12
Medium White	.14 @17

Gum Shellac—

	₱ lb
Bleached, Commercial	.35 @38
Bone Dry	.44 @46
Button	.40 @50
Diamond I	.53 @55
Fine, Orange	.35 @40
A. C. Garnet	.45 @46
G. A. L.	.32 @33
Kala Button	.22 @25
D. C.	.56 @57
Octagon B	.51 @52
T. N.	.30 @32
V. S. O.	.53 @55

Colors in Oil—

	₱ lb
Black, Lampblack	.12 @14
Blue, Chinese	.36 @46
Blue, Prussian	.32 @36
Blue, Ultramarine	.13 @16
Brown, Vandyke	.11 @14
Green, Chrome	.12 @16
Green, Paris	@24
Sienna, Raw	.12 @15
Sienna, Burnt	.12 @15
Umber, Raw	.11 @14
Umber, Burnt	.11 @14

White Lead, Zinc, &c.—

	₱ lb
Lead, English white, in Oil	.10½@10¾
Lead, American White:	
Lots of 500 lb or over, in Oil	@ 7
Lots less than 500 lb, in Oil	@ 7½
Lead, White, in oil, 25 lb tin pails, add to keg price	@ ⅛
Lead, White, in oil, 12½ lb tin pails, add to keg price	@ 1
Lead, White, in oil, 1 to 5 lb ass'ted tins, add to keg price	@ 1½

Lead, American. Terms: For lots 12 tons and over ¼c rebate; and 2% for cash if paid in 15 days from date of invoice; for lots of 500 lbs. and over 2% for cash if paid in 15 days from date of invoice, for lots of less than 500 lbs. net.

	₱ lb
Zinc, American, dry	5⅝@ 5½
Zinc, French:	
Antwerp, Red Seal, dry	8¾
Antwerp, Green Seal, dry	10¾
Paris, Red Seal, dry	9¼
Paris, Green Seal, dry	.11

Zinc, V. M. French, in Poppy Oil:
Green Seal:
Lots of 1 ton and over 13½@13⅝
Lots of less than 1 ton 13⅝@13¾

Zinc, V. M. French, in Poppy Oil:
Red Seal:
Lots of 1 ton and over 11⅞@12⅛
Lots of less than 1 ton 12⅛@12⅜
Discounts.—French Zinc.—Discounts to buyers of 10 bbl. lots of one or mixed grades 1%; 25 bbls., 2%; 50 bbls., 4%.

Dry Colors—

	₱ lb
Black, Carbon	.6¼@10
Black Drop, American	.3½@ 8
Black Drop, English	.5 @15
Black, Ivory	.16 @20
Lamp, commercial	.4 @ 6
Blue, Celestial	.4 @ 6
Blue, Chinese	.30 @33
Blue, Prussian	.28 @32
Blue, Ultramarine	.3½@15
Brown, Spanish	½@ 1
Carmine, No. 40	$3.10@3.25
Green, Chrome, ordinary	.3½@ 5
Green, Chrome, pure	.17 @25
Lead, Red, bbls., ½ bbls., kegs.	@ 7¼
Litharge, bbls., ½ bbls., kegs.	@ 7¼
Ocher, American	₱ ton $8.50@16.00
American Golden	.2½@ 3¼
French	.1¼@ 2
Foreign Golden	.3 @ 4
Orange Mineral, English	.10 @12
French	.11¾@12
German	.10 @12
American	.8¾@ 9
Red, Indian, English	.4¼@ 6
American	.3 @ 3¼
Red, Turkey, English	.4 @10
Red, Tuscan, English	.7 @10
Red, Venetian, Amer.	₱ 100 lb $0.50@1.25
English	₱ 100 lb $1.15@1.60
Sienna, Italian, Burnt and Powdered	.3 @ 9
Italian, Raw, Powdered	.3 @ 7
American, Raw	.1¼@ 2
American Burnt and Pow'd.	.1¼@ 2
Talc, French	₱ ton $18.00@25.00
American	₱ ton 15.00@25.00
Terra Alba, French	₱ 100 lb .90@ 1.00
English	₱ 100 lb .80@ 1.00
American	₱ 100 lb, No. 1, .75@ .80
American	₱ 100 lb, No. 2, .60@ .65
Umber, T'key, Bnt. & Pow.	.2 @ 3¼
Turkey, Raw and Powdered	.2¼@ 3¼
Burnt, American	.1¼@ 2
Raw, American	.1¼@ 2
Yellow Chrome, Pure	.12 @16
Vermilion, American Lead	.7 @25
Quicksilver, bu'k	.65 @..
Quicksilver, bags	@65
English, Imported	.65 @70
Chinese	$0.90@1.00

Current Hardware Prices.

General Goods.—In the following quotations General Goods—that is, those which are made by more than one manufacturer—are printed in *Italics*, and the prices named, unless otherwise stated, represent those current in the market as obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. Very small orders and broken packages often command higher prices, while lower prices are frequently given to larger buyers.

Special Goods.—Quotations printed in the ordinary type (Roman) relate to goods of particular manufacturers, who are responsible for their correctness. They usually represent the prices to the small trade, lower prices being obtainable by the fair retail trade, from manufacturers or jobbers.

Range of Prices.—A range of prices is indicated by means of the symbol @. Thus 33⅓ @ 33⅓ & 10% signifies that the price of the goods in question ranges from 33⅓ per cent. discount to 33⅓ and 10 per cent. discount.

Names of Manufacturers.—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE DIRECTORY, issued May, 1907, which gives a classified list of the products of our advertisers and thus serves as a DIRECTORY of the Iron, Hardware and Machinery trades.

Standard Lists.—"The Iron Age Standard Hardware Lists" contains the list prices of many leading goods.

Additions and Corrections.—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

Adjusters, Blind—

Columbian and Domestic.....33⅓%
Norris's 10%
Zimmerman's—See Fasteners, Blind.

Window Stop—

Ives' Patent.....35%
Taplin's Perfection.....35%

Ammunition—See *Caps, Cartridges, Shells, &c.*

Anti-Rattlers—

Fernald Mfg. Co. Burton Anti-Rattlers, ₱ doz. pairs, Nos. 1, $0.75; 2, $0.60; 4, $1.00; 5, $0.50.
Fernald Quick Shifter, ₱ doz. pairs .....$2.00@$3.00

Anvils—American—

Eagle Anvils.....₱ lb @8½¢
Hay-Budden, Wrought.....9½@9¾¢
Trenton .....₱ lb 9½@9¾¢

Imported—

Peter Wright & Sons, ₱ lb, 84 to 349 lb. 11¢; 350 to 600 lb, 11½¢.

Anvil, Vise and Drill—

Millers Falls Co., $15.00.....15&10%

Apple Parers—See *Parers, Apple, &c.*

Aprons, Blacksmiths'—

Livingston Nail Co.....33⅓%

Augers and Bits—

Com. Double Spur.....75@80%
Jennings' Pat., Bright.65&10@70%
Black Lip or Blued...65@65&5%
Boring Mach. Augers.....70%
Car Bits, 12-in. twist.....40&10%
Ford's Auger and Car Bits.....40&5%
Ft. Washington Auger Co., Conard's 35%
Forstner Pat. Auger Bits.....25%
C. E. Jennings & Co.:
No. 10 ext. lip, R. Jennings' list, 25&7½%
No. 30, R. Jennings' list.....50%
Russell Jennings'.....25&10&2½%
L'Hommedieu Car Bits.....15%
Mayhew's Countersink Bits.....45%
Pugh's Black.....20%
Pugh's Jennings' Pattern.....35%
Snell's Auger Bits.....60%
Snell's Bell Hangers' Bits.....60%
Snell's Car Bits, 12-in. twist.....60%
Snell's King Auger Bits.....50%
Wright's Jennings' Bits.....50%

Bit Stock Drills—See *Drills, Twist.*

Expansive Bits—

Clark's Patteru, No. 1, ₱ doz. $26; No. 2, $18.....60&10%
Ford's, Clark's Patteru.....66⅔&5%
C. E. Jennings & Co., Steer's Pat..25%
Lavigne Pat., small size, $18.00; large size, $26.00.....60&10%
Swan's 60%

Gimlet Bits—

Per gro.
Common Dble. Cut....$3.00@3.25
German Pattern, Nos. 1 to 10, $4.75; 11 to 13, $5.75

Hollow Augers—

Bonney Pat., per doz..$6.50@7.00
Ames .....25&10%
Universal 20%

Ship Augers and Bits—

Ship Augers.....40&10%
Ford's .....33⅓&5%
C. E. Jennings & Co.:
L'Hommedieu's 6%
Watrous' .....33⅓&7½%
Snell's 40%

Awl Hafts—See *Handles, Mechanics' Tool.*

Awls—

Brad Awls:
Handled .....gro. $2.75@3.00
Unhdled, Shldered..gro.63@66¢
Unhandled, Patent..gro.66@70¢
Peg Awls:
Unhandled, Patent..gro. 31@34¢
Unhdled, Shldered..gro. 65@70¢
Scratch Awls:
Handled, Com...gro. $3.50@4.00
Handled, Socket..gro.$11.50@12.00

Awl and Tool Sets—See *Sets, Awl and Tool.*

Axes—

Single Bit, base weights: Per doz.
First Quality.....$4.75@5.00
Second Quality.....$4.25@4.50
Double Bit, base weights:
First Quality.....$7.00@7.50
Second Quality.....$6.50@6.75

Axle Grease—See *Grease, Axle*

Axles—*Iron or Steel*

Concord, Loose Collar..4½@5 ¢
Concord, Solid Collar...5¾@5¼¢
No. 1 Common, Loose....5¾@4¼¢
No. 1½ Com., New Style.4½@5 ¢
No. 2 Solid Collar.....4½@5 ¢
Half Patent:
Nos. 7, 8, 11 and 12..65@65&10%
Nos. 13 to 14.....65@65&10%
Nos. 15 to 18.....70@70&10%
Nos. 19 to 22.....70@70&10%

Boxes, Axle—

Common and Concord, not turned lb., 5@6¢
Common and Concord, turned. lb., 6@7¢
Half Patent.....lb., 9½@10¢

Bait—Fishing—

Hendryx:
A Bait.....20%
B Bait.....25%
Competitor Bait.....20&5%

Balances—Sash—

Caldwell new list.....50%
Pullman .....50&10@60%

Spring—

Spring Balances.....50&10@60%
Chatillon's:
Light Spg. Balances.....50@50&10%
Straight Balances.....40@40&10%
Circular Balances.....50&10%
Large Dial.....30%

Barb Wire—See *Wire, Barb.*

Bars—Crow—

Steel Crowbars, 10 to 40 lb.... per lb., —@2½@2¼¢

Towel—

No. 10 Ideal, Nickel Plate..₱ gro. $8.50

Beams, Scale—

Scale Beams.....40%
Chattillon's No. 1.....30%
Chattillon's No. 2.....40%

Beaters, Carpet—

Holt-Lyon Co.:
No. 12 Wire Coppered ₱ doz. $0.80; Tinned $0.85
No. 11 Wire Coppered ₱ doz. $1.15; Tinned $1.20
No. 10 Wire Tinned.....₱ doz. $1.50

Beaters, Egg—

Holt-Lyon Co.:
Holt, per doz., No. 5, Jap'd, $0.80; No. A, Jap'd, $1.15; No. B, Jap'd, $1.85; No. 6, Jap'd, $1.65.
Lyon, Jap'd, per doz., No. 2, $1.35.
Taplin Mfg. Co.:
Improved Dover, per gro., No. 60, $6.00; No. 75, $6.50; No. 100, $7.00; No. 102, Tin'd, $8.50; No. 150, Hotel, $15.00; No. 152, Hotel Tin'd, $17.00; No. 200, Tumbler, $8.50; No. 202, Tumbler Tin'd, $9.50; No. 300, Mammoth, per doz., $25.00.
Turner & Seymour Mfg. Co.:
T. & S. Dover.....$6.50

Bellows—

Blacksmith, Standard List..
Split Leather.....60&10@65%
Grain Leather.....50@50&10%

Hand—

Inch..	6	7	8	9	10	Net Prices.
Doz..	$5.00	5.50	6.00	6.50	7.50	

Molders—

Inch..	10	12	14	16	Net Prices.
Doz..	$7.50	9.00	12.00	15.00	

Bells—Cow—

Ordinary Goods...75&5@75&10&5%
High grade.....70&10@75%
Jersey .....75&10%
Texas Star.....50%

Door—

Home, R. & E. Mfg. Co.'s.....55&10%

Hand—

Polished, Brass.....50@50&10%
White Metal.....50@50&5%
Nickel Plated.....50%
Swiss 50%
Cone's Globe Hand Bells.....33⅓@33⅓%

Miscellaneous—

Farm Bells.....lb., 2¼@2½¢
Church and School....60@60&5%

Belting—Leather—

Extra Heavy, Short Lap..60&5%
Regular Short Lap....60&10&5%
Standard .....70&5%
Light Standard.....75%
Cut Leather Lacing.....40&10%
Leather Lacing Sides, per sq. ft. 2½¢

Rubber—

Agricultural (Low Grade).... 75@75&5%
Common Standard....70@70&10%
Standard .....70@70&5%
Extra .....60&5@60&10%
High Grade.....50&5@50&10%

Bench Stops—See *Stops, Bench*

Benders and Upsetters, Tire—

Green River Tire Benders and Upsetters 20%

Bicycle Goods—

John S. Leng's Son & Co.'s 1907 list:
Chain, Parts, Spokes.....50%
Tubes 60%

Bits—

Auger, Gimlet, Bit Stock Drills, &c.—See *Augers and Bits.*

Blocks—Tackle—

Common Wooden.....75%
B. & L. B. Co.:
Boston Wood Snatch, 50%; Eclipse Steel, 75%; Hollow Steel, 50&10%; Star Wire Rope, 50%; Tarbox Metal Snatch, 50%; Tarbox New Style Steel, 50&10%; Wire Rope Snatch, 50%.
Lane's Patent Automatic Lock and Junior 30%
See also Machines, Hoisting.

Boards, Stove—

Paper and Wood Lined.....40%
Embossed 50%

Boards, Wash—See *Washboards.*

Bobs, Plumb—

Keuffel & Esser Co.....33⅓%

Bolts—

Carriage, Machine, &c.—

Common Carriage (cut thread):
⅜ × 6 and smaller..70&5@—%
Larger and longer.....65@—%
Phila. Eagle, $3.00 list...80@—%
Bolt Ends.....65&5@—%
Machine (Cut Thread):
⅜ × 4 and smaller.70&7½@—%
Larger and longer...65&5@—%

Door and Shutter—

Cast Iron Barrel, Japanned, Round Brass Knob:

Inch	3	4	5	6	8
Per doz.	$0.30	.35	.45	.60	.80

Cast Iron Spring Foot, Jap'd:

Inch	6	8	10
Per doz.	$1.20	1.50	2.25

Cast Iron Chain, Flat, Japanned:

Inch	6	8	10
Per doz.	$1.00	1.40	1.65

Cast Iron Flat Shutter, Jap'd., Brass Knobs:

Inch	6	8	10
Per doz.	$0.75	.95	1.25

Wrought Barrel Japd..80@80&10%
Barrel Bronzed.....60&10%
Spring .....70&10@70&10&10%
Shutter .....50&5@50&10&5%
Square Neck.....75@75&10%
Square .....70&10@10%
Ives' Patent Door.....55%
Ives' Wrought Metal.....45%

Expansion—

Richards Mfg. Co.....50&10%

Plow and Stove—

Plow .....65&5@—%
Stove .....85@85&5%

Tire—

Common Iron.....80%
Norway Iron.....80%
American Screw Company:
Norway Phila., list Oct. 16, '84...80%
Eagle Phila., list Oct. 16, '84....82½%
Bay State, list Dec. 28, '99.....80%
Franklin Moore Co.:
Norway Phila., list Oct. 16, '84...80%
Eagle Phila., list Oct. 16, '84...82½%
Eclipse, list Dec. 28, '99.....80%
Russell, Burdsall & Ward Bolt & Nut Co.:
Empire, list Dec. 28, '99.....80%
Norway Phila., list Oct., '84.....80%
Eagle 82½%
Shelton Co.:
Tiger Brand, list Dec. 28, '99.....80%
Phila., Eagle, list Oct. 16,1881..82½%
Upson Nut Co.:
Tire Bolts.....72½%

Borers, Bung—

Borers Bung, Ring, with Handle:

Inch.....	1¼	1½	1¾	2
Per doz....	$4.80	5.60	6.40	8.00
Inch	2¼	2½		
Per doz.....	$8.65	11.50		

Enterprise Mfg. Co., No. 1, $1.25; No. 2, $1.75; No. 3, $2.50 each.....25%

Boxes, Mitre—

C. E. Jennings & Co.....25%
Langdon, New Langdon and Langdon Improved, 20&10%; Langdon Acme .....15&10%
Perfection 40%
Seavey 45%

Braces—

Common Bull, American....$1.50
Barber's .....50&10&10@60&10%
Fray's Genuine Spofford's.....60%
Fray's No. 70 to 120, 61 to 123, 207 to 213 .....60%
C. E. Jennings & Co.....50&5%
Mayhew's Ratchet.....60%
Mayhew's Quick Action Hay Pat...50%
Millers Falls Drill Braces.....25&10%
P., S. & W. Co., Peck's Pat..60&10%

Brackets—

Wrought Steel.....70&10@75&10%
Bradley Metal Clasp..80&10@80&10&5%
Griffin's Pressed Steel.....75@75&10%
Griffin's Folding Brackets .....70&10%
Taplin Victor Handy Egg Beater Bracket .....₱ doz. $1.50

Bright Wire Goods—See *Wire and Wire Goods.*

Broilers—

Kilbourne Mfg. Co.....75&20%
Wire Goods Co.....75%

Buckets, Galvanized—

M'f'gr's list, price per gross.

	Quart	*10*	*12*	*14*	
Water, Reg...	25.35	28.00	32.00		1045%
Water, Hvy...	45.35	48.00	52.00		
Fire, Rd. Btm.	32.00	34.65	38.65		
Well	$7.35	41.35	45.35		

Bull Rings—See *Rings, Bull*

Butts—Brass—

Wrought, High List, Oct. 26, '06. 45@45&10%
Cast Brass, Tiebout's.....40%

Cast Iron—

Fast Joint, Broad....40&10@50%
Fast Joint, Narrow...40&10@50%
Loose Joint.....70&10@75%
Loose Pin.....70&10@75%
Mayer's Hinges.....70@70&5
Parliament Butts.....70@70&5

Wrought Steel—

Bright.
Light Narrow, Light Reversible .....70&5%
Reversible and Broad..70&5%
Loose Joint, Narrow, Light Inside Blind, &c.....70%
Back Flaps, Table Chest.65% *Japanned.*
Light Narrow, Loose Pin, 40&5%
Light Narrow, Ball Tip..60%
Broad .....40&5%
Steeple Tipped.....70%
Ball Tipped.....70%

Extra 10@—

Cages, Bird—

Hendryx Brass: Series 3000, 5000, 1100, net list; 1200, 15%; 200, 300, 900 ..... 30%
Hendryx Bronze; Series 700, 800..30%
Hendryx Enameled..... 35%

Calipers—See *Compasses.*

Calks, Toe and Heel—

Blunt, 1 prong, per lb., 4¼@4¾¢
Sharp, 1 prong, per lb., 4¾@5¼¢
Burke's, Blunt, 4@4¾¢; Sharp, 4½@5¼¢
Lautier, Blunt, 4@4¼¢; Sharp, 4½@4¾¢
Perkins', Blunt, ℔ lb. 3.65¢; Sharp, 4.15¢

Can Openers—

See *Openers, Can.*

Caps, Percussion—

Eley's E. B..... 52@55¢
G. D.....per M 34@35¢
F. L.....per M 40@42¢
G. E.....per M 48@50¢
Musket .....per M 62@63¢

Primers—

*Berdan Primers, $2 per M..*20&5%
*Primer Shells and Bullets..*15&10%
All other primers per M.$1.52@1.60

Carpet Stretchers—

See *Stretchers, Carpet.*

Cartridges—

Blank Cartridges:

*32 C. F., $5.50.....*10&5%
*38 C. F., $7.00.....*10&5%
*22 cal. Rim, $1.50.....*10&5%
*32 cal. Rim, $2.75.....*10&5%
B. B. Caps, Con. Ball, Swgd.$1.90
B. B. Caps, Round Ball....$1.49
*Central Fire.....*25%
*Target and Sporting Rifle..*15&5%
*Primed Shells and Bullets.*15&10%
*Rim Fire, Sporting.....*60%
*Rim Fire, Military.....*15&5%

Casters—

*Bed .....*65&10%
*Plate .....*60&5%
*Philadelphia .....*70&10%
Acme, Ball Bearing..... 35%
Gem (Roller Bearing).....70&10&10&5%
Steel Gem..... 20%
Standard Ball Bearing..... 45%
Yale (Double Wheel) low list..40&10%

Cattle Leaders—

See *Leaders, Cattle.*

Chain, Proof Coil—

American Coil, Straight Link:

3-16	¼	5-16	⅜	7-16	½	9-16
$8.77	6.17	5.02	4.57	4.37	4.27	4.22
⅝	¾	⅞ to 1	1⅛ to 1¼ inch.			
$4.17	4.07	4.02	4.12			

In cask lots, deduct 25¢.

German Coil:
*6-0 to 1.....*70&5@70&10%
*2 and 3..*60&10&10@60&10&10&5%
*4, 5 and 6.....*50&10@50&10&5%

Halter—

*Halter Chains.....*60@60&5%
*German Pattern Halter Chains, list July 24, '97.....*60&10&5%
Covert Mfg. Co.
Halter ..... 35&3%

Cow Ties—

See *Halters and Ties.*

Trace, Wagon, &c.—

Traces, Western Standard: 100 pr.
6½—6-3, Straight, with ring.$28.00
6½—6-2, Straight, with ring.$29.00
6½—8-2, Straight, with ring.$32.00
6½—10-2, Str'ght, with ring.$37.00

NOTE.—Add 2c per pair for Hooks. Twist Traces; add per pair for Nos. 2 and 3, 2c; No. 1, 3c; No. 0, 4c to price of Straight Link.

*Eastern Standard Traces, Wagon Chain, &c..*60&10@60&10&5%

Miscellaneous—

Jack Chain, list July 10, '93:
*Iron .....*60&10%
*Brass *60%
Safety and Plumbers' Chain, 60&10%
Gal. Pump Chain....lb. 4½@4¾%
Covert Mfg. Co.:
Breast, Halter, Heel, Rein, Stallion 40%
Oneida Community:
American Halter, Dog and Kennel Chains ..... 35&2½@40%
Niagara Dog Leads and Kennel Chains ..... 45@50&5%
Wire Goods Co.:
Dog Chain..... 70%
Universal Dbl. Jointed Chain..... 50%

Chain and Ribbon, Sash—

Oneida Community:
Steel Chain..... 60%
Pullman:
Bronze Chain, 60%; Steel Chain 60&10%
Sash Chain Attachments, per set..8¢
Aluminoy Sash Ribbon, per 100 ft.....$1.25@3.00
Sash Ribbon Attachments, per set..8¢

Chalk—(From Jobbers.)

Carpenters' Blue....gro., 50@55¢
Carpenters' Red.....gro., 45@50¢
Carpenters' White...gro., 40@45¢

Checks, Door—

Bardsley's 45%
Pullman, per gro.....$51.00
Russwin 33⅓%

Chests, Tool—

American Tool Chest Co.:
Boys' Chests, with Tools..... 50%
Youths' Chests, with Tools..... 35%
Gentlemen's Chests, with Tools..25%
Farmers', Carpenters,' etc., Chests, with Tools..... 20%
Machinists' and Pipe Fitters' Chests, Empty..... 45%
Tool Cabinets..... 45%
C. E. Jennings & Co.'s Machinists' Tool Chests..... 7½%

Chisels—

Socket Framing and Firmer

*Standard List.....*75&10@—%
Buck Bros..... 30%
C. E. Jennings & Co.:
Socket Firmer No. 10.....25&7½%
Socket Framing No. 15.....25&7½%
Swan's ..... 66⅔@70%
L. & I. J. White Co.....30@30&5%

Tanged—

*Tanged Firmers.....*30&5@35%
Buck Bros..... 30%
C. E. Jennings & Co. Nos. 191, 181..25%
L. & I. J. White Co.....25&5%

Cold— *lb.*

*Cold Chisels, good quality..*13@15¢
*Cold Chisels, fair quality..*11@12¢
Cold Chisels, ordinary... 9@10¢

Chucks—

Almond Drill Chucks..... 35%
Almond Turret Six-Tool Chuck.....40%
Beach Pat., each $8.00.....35&5%
Empire 25%
Blacksmiths' 25%
Jacobs' Drill Chucks..... 35%
Pratt's Positive Drive..... 25%
Skinner Patent Chucks:
Independent Lathe Chucks.....35%
Universal, Reversible Jaws.....35%
Combination, Reversible Jaws....35%
Drill Chucks, New Model, 25%; Standard, 45%; Skinner Pat., 25%; Positive Drive..... 40%
Planer Chucks..... 30%
Face Plate Jaws..... 35%
Standard Tool Co.:
Improved Drill Chuck..... 45%
Union Mfg. Co.:
Combination, Nos. 1, 2, 3, 4, 5, 6, 7, 8 and 17, 40%; No. 21..... 35%
Scroll Combination, Nos. 83 and 84 ..... 30%
Geared Scroll, Nos. 33, 34 and 35..25%
Independent Iron, Nos. 18 and 318.35%
Independent Steel, No. 64..... 25%
Union Drill, Nos. 000, 00, 100, 101, 102, 103, 104..... 35%
Union Czar Drill..... 25%
Universal, 11, 12, 16, 17, 13, 14, 15..40%
Universal, No. 42..... 35%
Iron Face Plate Jaws, Nos. 28, 30, 48 and 50..... 35%
Steel Face Plate Jaws, Nos. 70 and 72 ..... 30%
Westcott Patent Chucks:
Lathe Chucks..... 50%
Little Giant Auxiliary Drill..... 50%
Little Giant Double Grip Drill..50%
Little Giant Drill, Improved..... 50%
Oneida Drill..... 50%
Scroll Combination Lathe..... 50%

Clamps—

Adjustable, Hammers'.....20@20&5%
Carriage Makers', P., S. & W. Co. ..... 50&10%
Resiy, Parallel..... 33⅓&10%
Myers' Hay Rack..... 45%
Lineman's Swedish Neverturn.....65%
Wood Workers, Hammers'.....40&10%
Saw Clamps, see Vises, Saw Filers'.

Cleaners, Drain—

Iwan's Champion, Adjustable..... 50%
Iwan's Champion, Stationary..... 40%

Sidewalk—

Star Socket, All Steel, ℔ doz. $4.05 net
Star Shank, All Steel, ℔ doz. $3.24 net
W. & C. Shank, All Steel, ℔ doz., 7½ in., $3.00; 8 in., $3.25.

Cleavers, Butchers'—

Foster Bros..... 30%
Fayette R. Plumb..... 30%
L. & I. J. White Co..... 30%

Clippers, Horse and Sheep—

Chicago Flexible Shaft Company:
1902 Chicago Horse, each..$10.75
20th Century Horse, each..$5.00
Lightning Belt Horse, each.$15.00
Chicago Belt Horse, each.$20.00
Stewart's Enclosed Gear Horse, each..... $6.75
Stewart's Patent Sheep Shearing Machine, each..... $12.75
Stewart Enclosed Gear Shearing Machine, No. 8, each..$9.75

Clips, Axle—

Regular Styles, list July 1, '05, 80&8&10%

Cloth and Netting, Wire

—See *Wire, &c.*

Cocks, Brass—

Hardware list:
Plain Ribbs, Globe, Kerosene, Racking, Liquor, Bottling, &c. .....70@—%
Compression Ribbs..60&10@—%

Coffee Mills—

See *Mills, Coffee.*

Collars, Dog—

Nickel Chain, Walter B. Stevens & Son's list..... 40%
Leather, Walter B. Stevens & Son's list 40%

Compasses, Dividers, &c.

*Ordinary Goods.....*70&10@75%
Wm. Schollhorn Co.:
Excelsior Dividers..... 60%
Lodi Dividers..... 70&10%

Conductor Pipe,—

L. C. L. to Dealers:

	Galvanized		
Galv. Steel.	*Charcoal Iron.*	*Copper. 14, 16&20 oz.*	
Eastern:			
70%	50&17½%	45%	
Central:			
70&5%	55%	45%	
Western and Southern:			
65&10%	50&2½%	40&5%	
So. Western			
65&5%	45&5%	40&2½%	

Terms, 60 days; 2% cash 10 days. Factory shipments generally delivered.
See also Eave Troughs.

Coolers, Water—

L. & G. Mfg. Co.:

Gal.	2	3	4	6	8
Galvanized, ea.	$1.85	$2.00	$2.25	$2.90	$3.90
Galvanized, Lined, side handles, Gal.	2	3	4	6	8
Each	$1.95	$2.15	$2.40	$3.30	$4.15

White Enameled..... 10%
Agate Lined..... 10%

Coopers' Tools—

See *Tools, Coopers'.*

Coppers' Soldering—

*Soldering Coppers, 3 lbs. to pair and heavier, 30@33¢; lighter than 3 lb. to pair.....*32@35¢

Cord— Sash—

Braided, Drab.....lb. 35¢
Braided, White, Com., Nos. 8 to 12, 26¢; No. 7, 26½¢; No. 6, 27½¢. In lots of 12 doz. or over, 1 cent less per pound.
*Cable Laid Italian, lb., No. 18..*37¢
Italian, lb., A, No. 18, 25¢; B, 22¢
Common India.....lb., 11@11½¢
Cotton Sash Cord, Tw'ted.18@20¢
*Patent Russia.....lb...*20¢
*Cable Laid Russia.....lb...*21¢
*India Hemp, Br'd'd.....lb...*21¢
*India Hemp, Twisted..lb.*13@14¢
*Patent India, Twisted...lb...*17¢
Pearl Braided, cotton, No. 6, ℔ lb. 27½¢; No. 7, 25½¢; Nos. 8 to 12, 26¢
Eddystone, Braided, Nos. 8 to 12, 26¢; 7, 26½¢; 6, 27½¢.
Harmony Cable Laid Italian, Nos. 7 to 10.....℔ lb 23 ¢
Pullman:
Wire Sash Cord..... 10%
Sash Cord Attachments, per doz.10¢
Samson, Nos. 8 to 12:
Braided, ℔ lb., Drab Cotton, 55¢; Italian Hemp, 40¢@50¢; Linen, 65¢; White Cotton, 50¢; Spot Cord.....50¢
Massachusetts, White....℔ lb 40¢
Massachusetts, Drab....℔ lb 45¢
Phoenix, White, Nos. 8 to 12, 27¢; } 15%
Silver Lake, per lb.:
A, Drab, 45¢; A, White, 40¢;
B, Drab, 40¢; B, White, 35¢;
Italian Hemp, 40¢; Linen....57½¢
See also Chain and Ribbon.

Wire, Picture—

List July 10, 1906.....90@—%
Hendryx Standard Wire Picture Cord, old list, 85&10%
Turner & Stanton Co. Wire Picture Cord ..... 85&10%

Cradles—

*Grain .....*40&12½%

Crayons—

White Round Crayons, Cases, 100 gro., $6.50@$7.50 at factory, but lower prices made by jobbers
Zelnicker's Lumber. ℔ gro.
White and Purple, Indelible....$7.50
Blue, Red, Green, Yellow and Terra Cotta, $6.50; Black.....$4.00
Giant Lumber, 5¼ in. x 15-16 in. round, all colors, $16.25; Indelibles $18.75
Genuine Soapstone, Metal Workers', 5 in. x ¼ in. Round, $2.50; 5 in. x ¼ in. Square, $1.75; 5 x ½ x 3-16, $2.50; 5 x 1¼ x 3-16.....$3.00

Crooks, Shepherds'—

Fort Madison, per doz., Heavy, $5.50; Light $5.00

Crow Bars—See *Bars, Crow.*

Cultivators—

Victor Garden..... 50%

Cutlery, Table—

International Silver Company:
No. 12 M'd'm Knives, 1847, ℔ doz. $3.50
Star, Eagle, Rogers & Hamilton and Anchor ..... ℔ doz. $3.00
Wm. Rogers & Son..... ℔ doz. $2.50

Cutters— Glass—

H. H. Mayhew Co..... 40%
Red Devil..... 60%
B. Mfg. Co..... 40%
Woodward 50%

Meat and Food—

American 30%

Nos.	401	402	403	404	405	406	407
Each	$5	$7	$10	$12	$25	$50	$60

Enterprise:

Nos.	5	10	12	22	32	
Each	$2	$3	$2.75	$4.50	$6	25@25&7½%

No. 202. $1.50..... 40&7½%
P., S. & W. Co.:
Dixon's ..... ℔ doz. 33⅓%

Nos.	1	2	3	4
	$14.00	$17.00	$19.00	$30.00

Ideal ..... 40@10&5%
Hales ..... 60&10&5%
Little Giant..... ℔ doz. 40@50%

Nos.	305	310	312	320	322
	$35.00	$48.00	$44.00	$72.00	$68.00

New Triumph No. 605. ℔ doz. $24.00, 40&10%
Russwin Tool. No. 1, $24.00; No. 2, $27.00 ..... 45&10&10%
$15.00 $19.00
Enterprise Beef Shavers..... 25@30

Slaw and Kraut—

Henry Disston & Sons:
Slaw and Kraut Cutters..... 35%
Corn Graters..... 30%
J. M. Mast Mfg. Co.:
Slaw Cutters, 1 Knife....℔ doz. $3.00
Combined Slaw Cutter and Corn Grater ..... ℔ doz. $4.00

Tobacco—

All Iron, Cheap..doz. $1.25@$1.50
Enterprise ..... 25@30%
National, ℔ doz., No. 1, $21; No. 2, $18 ..... 40%

Diggers, Post Hole, &c.—

Disston's:
Rapid, ℔ doz., $24.00..... 25%
Samson, ℔ doz., $34.00..... 25%
Iwan's Imp'ved Post Hole Auger..40%
Vaughan Pattern Post Hole Augers, ℔ doz., $7.00
Perfection Post Hole Diggers, ℔ doz. $8.75
Split Handle Post Hole Diggers, ℔ doz. $7.75
Hercules Pattern, ℔ doz.....$10.00
Kohler's, ℔ doz., Universal, $15.00; Little Giant, $12.00; Hercules, $10.00; Invincible, $9.00; Rival, $8.50; Pioneer.....$7.50
Never-Break Post Hole Diggers, ℔ doz., $24.00..... 60%

Dividers—See *Compasses.*

Drawing Knives—

See *Knives, Drawing.*

Dressers, Emery Wheel—

Sterling Emery Wheel Dressers..... 35%
Sterling Wheel Dresser Cutters..... 35%

Drills and Drill Stocks—

Blacksmiths' Common Drilling Machines .....$1.50@$1.75
Breast, Millers Falls..... 15&10%
Breast, P., S. & W..... 33⅓%
Goodell Automatic Drills.50&10@60&10%
Millers Falls Automatic Drills.33⅓&10%
Ratchet, Curtis & Curtis..... 25%
Ratchet, Parker's..... 40%
Ratchet, Weston's..... 40%
Ratchet, Weston's, Style H Improved 40%
Ratchet, No. 912..... 40%
Ratchet, Celebrated..... 40%
Ratchet, Whitney's, P., S. & W., 50&5%
Whitney's Hand Drill, No. 1, $10.00; Adjustable, No. 10, $12.00..... 33⅓%

Twist Drills—

*Bit Stock.....*60&10&10@70%
Taper and Straight Shank.... 60&10@60&10&5%

Drivers, Screw—

*Screw D'ver Bits, per doz.*45@50¢
Baisey's Screw Holder and Driver, ℔ doz., 2½-in., $6; 4-in., $7.50; 6-in. ℔ 50%
Buck Bros.' Screw Driver Bits..... 30%
Champion 50%
Disston's 70%
Fray's Hol. H'dle Sets, No. 3, $12..50%
Ford's Brace Screw Drivers....40&10%
Gay's Double Action Ratchet..... 35%
Goodell's Auto.....65@65&10%
Mayhew's Blade Handle..... 40%
Mayhew's Monarch..... 40%
Millers Falls, Nos. 20 and 21...25&10%
Millers Falls, Nos. 11, 12, 41, 42..15&10%
Smith & Hemenway Co., Neverturn, 66⅔%; Elmora, 60%; Star, 30&10%
Swan's:
Nos. 7565 to 7568, 50%; No. 7540, 40&10%

Eave Trough, Galvanized—

Territory.	*L. C. L. Galvanized*	
Galv. Steel.	*Charcoal Iron.*	*Copper. 14, 16&20 oz.*
Eastern:		
75&5%	60&10%	45%
Central:		
75&10%	65%	45%
Western and Southern:		
75%	60&5%	40&5%
So. Western:		
70&10%	55&7½%	42½%

Terms.—2% for cash. Factory shipments generally delivered.
See also Conductor Pipe and Elbows.

Elbows and Shoes—

Factory shipments, all territories:

	Galv. Steel and Galv. C. I. Standard Gauge
No. 26	50%
No. 24	25%
No. 22	10%
Copper	60&10%

Elbows, Stove Pipe—

Edwards, Standard Blue.....40&10&10%
Edwards, Royal Blue..... 40&10&10%
Reeves, Dover, one piece.....10&10%

Emery, Turkish—

	4 to 4½:	*5 to 220:*	*Flour.*
Kegs .....lb. 5 ¢	5½ ¢	5½ ¢	
½ Kegs.....lb. 5½ ¢	5¾ ¢	5¾ ¢	
¼ Kegs.....lb. 5½ ¢	6 ¢	4 ¢	
10-lb. cans, 10 in case.... 6½ ¢	7 ¢	6 ¢	
10-lb. cans, less than 10.....10 ¢	10 ¢	8 ¢	
Less quantity..10 ¢	10 ¢	8 ¢	

NOTE.—In lots 1 to 3 tons a discount of 10% is given.

Extractors, Lemon Juice
—See *Squeezers, Lemon.*

Fasteners, Blind—
Zimmerman's .....50&10%
Walling's .....40&10%
Upson's Patent.....40%

Cord and Weight—
Ives and Titan.....33⅓%

Faucets—
Cork Lined.....50&10@60%
Metallic Key, Leather Lined..60&10@70%
Red Cedar.....40&5@40&10&5%
Petroleum.....70&10@75%
B. & L. B. Co.:
Metal Key.....60&10%
Star 60%
West Lock.....50&10%
John Sommer's Peerless Tin Key....40%
John Sommer's Boss Tin Key.....50%
John Sommer's Victor Mtl. Key.50&10%
John Sommer's Duplex Metal Key..60%
John Sommer's Diamond Lock.....40%
John Sommer's I.X.L. Cork Lined...50%
John Sommer's Reliable Cork Lined...50&10%
John Sommer's Chicago Cork Lined.60%
John Sommer's O. K. Cork Lined...50%
John Sommer's No Brand, Cedar....50%
John Sommer's Perfection, Cedar....40%
Self Measuring:
Enterprise, ℔ doz. $36.00.....40&10%
Lane's, ℔ doz. $36.00.....40&10%
National Measuring, ℔ doz. $36.40&10%

Felloe Plates—
See *Plates, Felloe.*

Files— Domestic—
List Nov. 1, 1899.
Best Brands.....70&10@75&10%
Standard Brands.....75&10@80%
Lower Grade.....75&10&10@80&10%

Imported—
Stubs' Tapers, Stubs' list, July 24, '97.....33 1-3@40%

Fixtures, Fire Door—
Allith Underwriters' Approved.....50%
Richards Mfg. Co.:
Universal, No. 103; Special, No. 104 .....$3.75
Fusible Links, No. 96.....50%
Expansion Bolts, No. 107.....60&10%

Grindstone—
Net Prices:

Inch	*15*	*17*	*19*	*21*
Per doz.	*$3.60*	*3.85*	*4.15*	*4.65*

P., S. & W. Co.....25%
Reading Hardware Co.....60%

Fodder Squeezers—
See *Compressors.*

Forks—
NOTE.—Manufacturers are selling from the list of September 1, 1904, but many jobbers are still using list of August 1, 1899, or selling at net prices.
Iowa Dig-Ezy Potato.....60&10%
Victor, Hay.....60&15&2½%
Victor, Manure.....66⅔%
Victor, Header.....65%
Champion, Hay.....60%
Champion, Header.....60%
Champion, Manure.....60&15&2½%
Columbia, Hay.....60&20%
Columbia, Manure.....70%
Columbia, Spading.....70&12½%
Hawkeye Wood Barley.....40%
W. & C. Potato Digger.....60&10%
Acme Hay.....60&20%
Acme Manure, 4 tine.....60&10&5%
Dakota Header.....60&20%
Jackson Steel Barley.....60&20%
Kansas Header.....65%
W. & C. Favorite Wood Barley.....40%
Plated.—See Spoons.

Frames— Wood Saw—
White, S'g't Bar, per doz..75@80¢
Red, S'g't Bar, per doz...$1.00@1.25
Red, Dbl. Brace, per doz.$1.40@1.50

Freezers, Ice Cream—

Qt.	*1*	*2*	*3*	*4*	*6*
Each	*$1.25*	*$1.60*	*$1.90*	*$2.20*	*$2.80*

Fruit and Jelly Presses—
See *Presses, Fruit and Jelly.*

Fry Pans—See *Pans, Fry.*

Fuse— *Per 1000 Feet.*
Hemp $2.75
Cotton 3.20
Waterproof Sgl. Taped.. 3.65
Waterproof Dbl. Taped.. 4.40
Waterproof Tpl. Taped.. 5.15
} 10&2½%

Gates, Molasses and Oil—
Stebbins' Pattern.....75@80%

Gauges—
Marking, Mortise, &c..50@50&10%
Chapin-Stephens Co.:
Marking, Mortise, &c.....50&50&10%
Disston's Marking, Mortise, &c..67½%
Wire, Brown & Sharpe's.....33⅓%
Wire, Morse's.....25%
Wire, P., S. & W. Co.....33⅓%

Gimlets— Single Cut—
Numbered assortments, per gro.
Nail, Metal, No. 1. $2.00; 2. $2.80
Spike, Metal, No. 1. $4.00; 2. $4.80
Nail, Wood Handled, No. 1, $2.80; 2. $2.60
Spike, Wood Handled, No. 1, $4.80; 2. $4.60

Glass, American Window
See *Trade Report.*

Glasses, Level—
Chapin-Stephens Co.....65@65&10%

Glue, Liquid Fish—
Bottles or Cans, with Brush..25&10@50%
Elwell's 40%

Grease, Axle—
Common Grade....gro.$6.00@6.50
Dixon's Everlasting, 10-lb pails, ea. 85¢; in boxes, ℔ doz., 1 lb, $1.20; 2 lb.....$2.00
Helmet Hard Oil.....25%

Griddles, Soapstone—
Pike Mfg. Co.....33⅓@33⅓&10%

Grinders—
Royal Mfg. Co.:
Alundum Grinding Machines, each, Nos. 01, $1.75; 1A, $2.50; 10, $5.00 .....30%
Alundum Sickle Grinders, each, Nos. 20, $5.00; 20A, $6.00; 20A Combined, $6.50.....30%
Alundum Disc Grinders, each, $2.50 .....30%

Grindstones—
Pike Mfg. Co.:
Improved Family Grindstones, ℔ inch, ℔ doz., $2.00.....33⅓%
Richards Mfg. Co., Eli and Cycle, Ball Bearing, mounted.....40%

Grips, Nipple—
Perfect Nipple Grips.....40&10&2%

Halters and Ties—
Cow Ties.....60&5@60&10%
Covert Mfg. Co.:
Web .....30&2%
Jute Rope.....35%
Sisal Rope.....20%
Cotton Rope.....45%
Hemp Rope.....45%
Oneida Community:
Am. Coil and Halters.....40@40&5%
Am. Cow Ties.....45@50%
Niagara Coil and Halters..45@50&5%
Niagara Cow Ties....45&5@50&10&5%

Hammers—
Handled Hammers—
Heller's Machinists'...55&10@55&10&5%
Heller's Farriers'.....40&5@40&10&5%
Peck, Stow & Wilcox Co.:
Crucible Steel.....50%
Farriers' .....40&10&5%
Riveting 50%
Machinists', revised list.....66⅔&5%
Blacksmiths' .....50&5%
Fayette R. Plumb:
A. E. Nail.....40&2½@40&12½%
Eng. and B. S. Hand.50&10&5@60&5%
Machinists' Hammers.....60@60&10%
Rivet and Tinners'.40&7½@40&12½&5%

Heavy Hammers and Sledges—
Under 3 lb., per lb., 50¢..80&5@—%
3 to 5 lb., per lb., 40¢..80&5@—%
Over 5 lb., per lb., 30¢.....80&10&5@—%
Wilkinson's Smiths'...lb. 9½@10¢

Handles—
Agricultural Tool Handles
Axe, Pick, &c....60&10@60&10&5%
Hoe, Rake, &c.....40%
Fork, Shovel, Spade, &c.:
Long Handles.....40%
D Handles.....40%

Cross-Cut Saw Handles—
Atkins' 40%
Champion 50%
Disston's 50%

Mechanics' Tool Handles—
Auger, assorted...gro.$3.00@$3.50
Brad Awl.....gro.$1.65@$1.75
Chisel Handles, Ass'd, per gro.:
Tanged Firmer, Apple, $2.40@$2.65; Hickory.....$2.15@2.40
Socket Firming, Apple, $1.75@$1.95; Hickory....$1.60@$1.75
Socket Framing, Hickory, $1.60@$1.75
File, assorted.....gro. $1.30@$1.40
Hammer, Hatchet, &c. 60&10@60&10&5%
Hand Saw, Varnished, doz. 80¢85¢; *Not Varnished*...65@75¢
Plane Handles:
*Jack, doz. 30¢; Jack, Bolted.*75¢
*Fore, doz. 45¢; Fore, Bolted.*90¢
Chapin-Stephens Co.:
Carving Tool.....30@30&10%
Chisel .....60@60&10%
File and Awl.....60@60&10%
Saw and Plane.....30@30&10%
Screw Driver.....30@30&10%
Millers Falls Adj. and Ratchet Auger Handles .....15&10%
Nicholson Simplicity File Handle.... ℔ gro. $0.85@$1.50
W. A. Zelnicker Supply Co.:
Hammer, ℔ doz., 12 in., $2.00; 14 in., $2.00; 16 in., $2.30; 18 in., $2.50; 20 in., $2.70; 22 in., $3.00; 24 in., $3.30; 26 in., $3.50; 30 in., $3.80.
Sledge, ℔ doz., oval, 30 in., $3.80; octagon, 30 in., $3.80; oval, 36 in., $4.00; octagon, 36 in. $4.00.
Axe ℔ doz. 28 to 34 in., $5.60; 36 in., $5.80.
Adze, ℔ doz., 36 in., $5.80; 36 in., $7.80.
Pick, ℔ doz., R. R., 36 in., $8.00; coal, 34 in., $5.80.
Hatchet, ℔ doz., 12 to 14 in., $2.00.
} 50%

Hangers—
NOTE.—Barn Door Hangers are generally quoted per pair, without track, and Parlor Door Hangers per double set with track, &c.
Allith Mfg. Co.:
Reliable, Nos. 1 and 2; Allith, No. 3; Allith Adjustable, No. 6; Reliable Parlor Door.....1.50%
Chicago Spring Butt Co.:
Friction 25%
Oscillating 25%
Big Twin.....25%
Chisholm & Moore Mfg. Co.:
Baggage Car Door.....50%
Elevator 30%
Railroad 50%
Cronk & Carrier Mfg. Co.:
Loose Axle.....60&2½%
Roller Bearing.....70&2½%
Griffin Mfg. Co.:
Solid Axle, No. 10, $12.00..60&10%
Roller Bearing, No. 11, $15.00, 60&10%
Roller Bearing, Ex. Hy., No. 22, $18.00.....60&10%
Bull Dog, $24.00.....70%
Lane Bros. Co.:
Parlor, Ball Bearing, $4.00; Standard, $3.15; No. 105, $2.85; New Model, $2.80; New Champion $2.25
Barn Door, Standard.....60&10%
Hinged .....net $6.08
Covered .....60&5%
Special .....70&5%
Lawrence Bros.:
Advance .....55&10%
Cleveland .....70&7½%
Clipper, No. 75.....60%
Crown .....55&10%
Cyclone, No. 40.....net $6.50
Tandem, No. 50.....net $7.50
New York.....55&10%
McKinney Mfg. Co.:
Roller Bearing, Nos. 1 and 2.70%
Anti-Friction 60%
Hinged Hangers, King Charm.60%
Richards Mfg. Co.:
Hangers, Nos. 47, 48, 147, 247, 60&5%
Pioneer Wood Track, No. 3..$2.25
Roller B'r'g St'l Track No. 12.$2.20
Roller B'r'g St'l Track No. 13.$2.50
Roller B'r'g, Nos. 39, 41, 43, 70&7½%
Hero, Adj. Track No. 19..50&10%
Adjustable Track Tandem Trolley Track No. 16.....50&10%
Seal, Steel Track No. 8.....$2.25
Auto Adj. Track No. 22.—50&5%
Trolley B. D. No. 17, $1.25; F. D. No. 120, $2.25; No. 121, $2.45; No. 150.....$2.50
Safety Underwriters F. D. No. 101 .....50%
Tandem No. 44..2½ and 3 60&10%
Palace, Adjustable Track No. 132 .....50&5%
Royal, Adjustable Track No. 122 .....50&10%
Ives' Wood Track No. 1.....$2.25
Trolley B. D. No. 20.....50&10%
Trolley B. D. No. 24, $1.30; No. 27, $1.40; No. 28.....$1.60
Roller Bearings, Nos. 37, 38, 39, 41, 43, 44, Sizes 1 and 2.70&7½%
Anti-friction, No. 42; No. 44, sizes 2½ and 3.....60%
Hinged Tandem No. 48....60&5%
Folding Door B. B. Swivel No. 135 .....40%
Taylor & Boggis F'y Co.'s Kidder's Roller Bearing.50&15&10&5%
Myers' Stayon Hangers.....60%
} Extra 10% often given.

Hangers— Garment—
Pullman Trouser, ℔ gro., 1 pair Flat Aluminoy, $9.00; 1 pair Round Nickeled, $9.00; 4 pair Round Nickeled, $27.00; 1 pair Flat Gun Metal, $12.00; 1 pair Flat Black Enameled, $7.50; 1 pair Wood Clamp, $13.50; Skirt Hangers, Folding, per gro., $21.00; Coat Hangers, Folding, per gro., $8.00; Garment Hanger Rods, Round Nickeled, per gro., $10.50; Garment Hanger Loops, Round Nickeled, per gro.....$10.50
Victor Folding.....℔ gro. $9.60

Gate—
Myers' Patent Gate Hangers, ℔ doz. net $4.50

Joist and Timber—
Lane Bros. Co.....30%

Hasps—
Griffin's Security Hasp.....50&10%
McKinney's Perfect Hasp, ℔ doz..60%

Hatchets—
Regular list, first qual..40&2½@—
Second quality.....50&5@—

Heaters, Carriage—
Clark, No. 5, $1.75; No. 5B, $2.00; No. 3, $2.25; No. 3D, $2.75; No. 7D, $3.00; No. 3E, $3.25; No. 1, $3.50.....25%
Clark Coal, ℔ doz., $0.75.....20%

Hinges—
Blind and Shutter Hinges
Surface Gravity Locking Blind: (Victor; National; 1868 O. P.; Niagara; Clark's O. P.; Clark's Tip; Buffalo.)

No.	*1*	*3*	*5*
Doz. pair	*$0.75*	*1.35*	*2.70*

Mortise Shutter: (L. & P., O. S., Dixie, &c.)

No.	*1*	*1½*	*2*	*2½*
Doz. pair	*$0.70*	*.65*	*.60*	*.55*

Mortise Reversible Shutter (Buffalo, &c.):

No.	*1*	*1½*	*2*
Doz. pair	*$0.70*	*.65*	*.60*

North's Automatic Blind Fixtures, No. 2, for Wood, $9.00; No. 3, for Brick, $11.50.....10%
Charles Parker Co.....70@75%
Parker Wire Goods Co.:
Hale & Benjamin Automatic Blind Hinges 20%
Hale's Blind Awning Hinges, No. 110, for wood, $9.00; No. 111, for brick, $9.00.....20%
Reading's Gravity.....60%
Stanley's Steel Gravity Blind Hinges, No. 1647½, ℔ doz. sets, without screws, $0.95; with screws, $1.25.
Wrightsville Hardware Co.:
O. S., Lull & Porter.....75&5%
Acme, Lull & Porter.....75%
Queen City Reversible.....75%
Shepard's Noiseless, Nos. 60, 65, 55 .....75&5%
Niagara, Gravity Locking, Nos. 1, 3 & 5.....75&5%
Tip Pat'n, No. 1.....75&10%
No. 3.....75&5%
Buffalo Gravity Locking, Nos. 1, 3 & 5.....70&10&5%
Shepard's Double Locking.....75%
Champion Gravity Locking.....75&5%
Pioneer .....75&10%
Empire 65%
W. H. Co.'s Mortise Gravity Locking, No. 2.....60&10%

Gate Hinges—
Clark's or Shepard's—Doz. sets:

No.	*1*	*2*	*3*
Hinges with L't'chs.	*$2.00*	*2.70*	*5.00*
Hinges only.....	*1.40*	*2.05*	*3.80*
Latches only.....	*.70*	*.70*	*.35*

New England:
With Latch.....*doz.*....@*$2.00*
Without Latch...*doz.*....@*$1.60*
Reversible Self-Closing:
With Latch.....*doz.*....@*$1.75*
Without Latch...*doz.*....@*$1.35*
Western:
With Latch.....*doz. $1.75*
Without Latch.....*doz. $1.15*
Wrightsville Hardware Co.:
Shepard's or Clark's Hinges and Latches, Hinges only or Latches only, Nos. 1, 2 or 3.....70%

Pivot Hinges—
Bommer Bros. Pivot.....40%
Lawson Mfg. Co. Matchless.....50%

Spring Hinges—
Holdback, Cast Iron...$6.75@$7.00
Non-Holdback, Cast Iron$6.50@$6.75
J. Bardsley:
Bardsley's Non-Checking Mortise Floor Hinges.....40%
Bardsley's Patent Checking.33⅓%
Bommer Bros.:
Bommer Ball Bearing Floor..40%
Bommer Spring Hinges.....40%
No. 999 Wrot, Steel Hold Back, ℔ gr. $9.00
Chicago Spring Butt Co.:
Chicago Spring Hinges.....25%
Triple End Spring Hinges....50%
Chicago (Ball Bearing) Floor..50%
Garden City Engine House....25%
Keene's Saloon Door.....25%
Columbian Hardware Co.:
Acme, Wrought Steel.....30%
Acme, Brass.....25%
American 30%
Columbia, ℔ gr., No. 14, $9.00; No. 18, $25.00
Columbia, Adj., No. 7, ℔ gr. $12.00
Columbian Hinges.....60&10%
Gem, new list.....30%
Clover Leaf.....℔ gr. $12.00
Oxford, new list.....30%
Floor Spring Hinges.....65&10%
Lawson Mfg. Co., Matchless....30%
Richards Mfg. Co.:
Superior Double Acting Floor Hinges 40%
Shelby Spring Hinge Co.:
Buckeye All Steel Holdback Screen Door.....℔ gr. $9.00
Chief Ball Bearing Floor Hinge 50%
Ball Bearing Door.....25%
No. 777, Sheet Steel Holdb'k, ℔ gr. pr.....$9.00
Superior Spring Hinge Co.:
Superior Floor Hinges.....33⅓%
} Extra 10% often given on most of these Hinges.

Wrought Iron Hinges—
Strap and T Hinges, &c., list December 20, 1904:
Light Strap Hinges..50&10%
Heavy Strap Hinges..60&5%
Light T Hinges.....50%
Heavy T Hinges.....40%
*Extra Hvy. T Hinges.*50&10%
Hinge Hasps.....33⅓%
Cor. Heavy Strap...60&5%
Cor. Ex. Heavy T...50&10%
} Extra 10&5&2½%

Screw Hook and Strap.
6 to 12 in..lb. 3½¢
14 to 20 in..lb. 3½¢
22 to 36 in..lb. 3½¢

Screw Hook and Eye:
¾ to 1 inch.....*lb.* 6½¢
⅝-inch.....*lb.* 7½¢
½-inch.....*lb.* 8½¢

Hitchers, Stall—
Covert Mfg. Co., Stall Hitchers..30&2%

Hods— Coal—
M'f'gr's list, price per gross.

Inch	*13*	*16*	*17*	*18*
Galv. Open	*$35*	*$39*	*$42*	*$46*
Jap. Open	*26*	*28*	*31*	*35*
Galv. Funnel	*43*	*48*	*52*	*56*
Jap. Funnel	*33*	*36*	*39*	*43*

} 10&5%

Masons' Etc.
Cleveland Wire Spring Co.:
Steel Brick, No. 162.....each $1.05
Steel Mortar, No. 158.....each $1.35

Hoes— Eye—
Scovil and Oval Pattern.....60&10@60&10&10%
Grub, list Feb. 25, 1899.....70&10@75&10%

D. & H. Scovil.....27½%
Am. Fork & Hoe Co. (Scovil Pattern).....60%

Handled—

NOTE.—Manufacturers are selling from the list of September 1, 1904, but many jobbers are still using list of August 1, 1899, or selling at net prices.

Cronk's Weeding, No. 1, $2.00; No. 2, $2.50
Star Double Bit.....$3.20
Ft. Madison Cotton Hoe....70&10&10%
Ft. Madison Crescent Cultivator Hoe, ₱ doz.....70&10%
Ft. Madison Mattock Hoes:
Regular Weight.....₱ doz. 40&5%
Junior Size.....₱ doz. $4.00
Ft. Madison Sprouting Hoe, ₱ doz., 60&10%
Ft. Madison Dixie Tobacco Hoe.....75&10&7½%
Kretsinger's Cut Easy.....70&10%
Warren Hoe.....45&10%
Ft. Madison Hatchet.....75&2%
B. B. 6 in., Cultivator Hoe.....$3.40
B. B., 6½ in.....$3.50
Ft. Wedding.....₱ doz., net, $4.35
W. & C. L'ting Shuffle Hoe, ₱ doz. $5.25

Hoisting Apparatus—

See *Machines, Hoisting.*

Holders— Bit—

Angular, ₱ doz. $24.00.....45&10%

Door—

Bardsley's, Iron, 40%; Brass and Bronze.....25%
Empire.....50%
Pullman.....35%
Richards Mfg. Co.: No. 117, Ever-ready, 40%; Nos. 118, 119, Sure Grip.....50%
Superior.....33⅓%

File and Tool—

Nicholson File Holders and File Handles.....33⅓@40%

Fruit Jar—

Triumph Fruit Jar Holder, ₱ gross, $10.80; ₱ doz.....$1.25

Trace and Rein—

Fernald Double Trace Holder, ₱ doz. pairs.....$1.25
Dash Rein Holder, ₱ doz. pairs..$1.25

Hones—Razor—

Pike Mfg. Co., Belgian and Swaty, 50%; German.....33⅓%

Hooks—Cast Iron—

Bird Cage, Reading.....40%
Clothes Line, Reading List.....40%
Coat and Hat, Reading.....45&20%
Coat and Hat, Wrightsville.....60&5%
Harness, Reading List.....40%

Wire—

Belt.....80%
Wire C. & H. Hooks....75@—%
Bradley Metal Clasp Wire, Coat and Hat, 70&10%; Ceiling.....70&10%
Columbian Hdw. Co., Gem.....70&5%
Parker Wire Goods Co., King..70&10%
Wire Goods Co.:
Acme, 60&10%; Chief, 70%; Crown, 75%; Czar, 65%; V Brace, 75%; Czar Harness, 50&10%.

Wrought Iron—

Box, 6 in., per doz., $1.00; 8 in., $1.25; 10 in., $2.50.
Cotton.....*doz. $1.05@$1.25*
Wrought Staples, Hooks, &c.—See Wrought Goods

Miscellaneous—

Hooks, Bench, see *Stops, Bench.*
Bush, Light, doz., $6.20; Medium, $6.75; Heavy, $7.65
Grass, best, all sizes, per doz.$3.00
Grass, common grades, all sizes, per doz.....*$1.50*
Whiffletree.....*lb. 5¾@6¢*
Hooks and Eyes:
Brass.....60@60&10%
Malleable Iron.....70@70&10%
Coverdale Mfg. Co. Gate and Scuttle Hooks.....40%
Ft. Madison Cut-Easy Corn Hooks, ₱ doz. $3.25 net
Turner & Stanton Co, Cup and Shoulder.....80&10%
Bench Hooks—See Bench Stops.
Corn Hooks—See Knives, Corn.

Horse Nails—

See *Nails, Horse.*

Horseshoes—

See *Shoes, Horses.*

Hose, Rubber—

Garden Hose, ¾-inch:
Competition.....*ft. 5@ 6¢*
3 ply Guaranteed.....*ft. 8@ 9¢*
4 ply Guaranteed.....*ft. 10@11¢*
Cotton Garden, ¾-in., coupled:
Low Grade.....*ft. 8@ 9¢*
Fair Quality.....*ft. 10@11¢*

Irons— Sad—

From ¼ to 10.....*lb. 3@3½¢*
B. B. Sad Irons.....*lb. 3¼@3½¢*
Mrs. Potts', cents per set:

	Nos. 50	55	60	65
Jap'd Tops	83	80	93	91
Tin'd Tops	88	85	98	95

New England Pressing..lb.3¾@4¢

Bar and Corner—

Richards Mfg. Co., Bar, 60&10%; Corner.....60%

Pinking—

Pinking Irons.....*doz.60¢*

Irons, Soldering

See *Copiers.*

Jacks, Wagon—

Covert Mfg. Co.:
Auto Screw.....30&2%; Steel, 45%
Lockport.....60%
Lane's Steel.....30&5%
Richards' Tiger Steel, No. 130...50&10%
Smith & Hemenway Co.'s.....25%

Ladder—

Richards Mfg. Co., Ladder Jacks..50%

Kettles—

Brass, Spun, Plain.....*20@25%*
Enameled and Cast Iron—See Ware, Hollow.

Knives—

Butcher, Kitchen, &c.—

Foster Bros.' Butcher, &c.....30%
Wilkinson Shear & Cutlery Co.....60%

Corn—

Columbian Cutlery Co., Wilcut Brand Knives and Hooks.....60%
Winnington Acme, ₱ doz., $2.65; Dent, $2.75; Adj. Serrated, $2.20; Serrated, $2.10; Yankee No. 1, $1.50; Yankee No. 2, $1.15.

Drawing—

Standard List.....*75&5@75&10%*
C. E. Jennings & Co., Nos. 45, 46, 25&7½%
Jennings & Griffin, Nos. 41, 42, 66⅔&7½%
Swan's.....66⅔@70%
Watrous.....16⅔%
L. & I. J. White.....20&5@25%

Hay and Straw—

Serrated Edge, per doz..$5.50@5.75
Iwan's Sickle Edge.....₱ doz. $9.50
Iwan's Serrated.....₱ doz. $10.00

Miscellaneous—

Farriers'.....*doz. $3.00@3.25*
Wostenholm's.....₱ doz. $3.00@3.25

Knobs—

Base, 2½-inch, Birch, or Maple, Rubber Tip.....*gro.$1.25@$1.40*
Carriage, Jap., all sizes.....*gro. 40@45¢*
Door, Mineral.....*doz. 65@70¢*
Door, Por. Jap'd.....*doz. 70@75¢*
Door, Por. Nickel..*doz. $2.05@2.15*
Bardsley's Wood Door, Shutters, &c.15%

Lacing, Leather—

See *Belting, Leather—*

Ladders, Store, &c.—

Allith Mfg. Co., Reliable.....50%
Lane's Store.....25%
Myers' Noiseless Store Ladders....50%
Richards Mfg. Co.:
Improved Noiseless, No. 112.....50%
Climax Shelf, No. 113.....50%
Trolley, No. 109.....50%

Ladies, Melting—

L. & G. Mfg. Co. (low list).....20%
P. S. & W.....40&10%
Reading.....60%

Lanterns—Tubular—

Regular, No. 0.....*doz. $4.35@4.50*
Side Lift, No. 0....*doz.$4.60@4.75*
Hinge Globe, No. 0.doz. $4.60@4.75
Other Styles.....*40@40&10%*

Bull's Eye Police—

3-inch.....*$4.25@4.50*

Latches— Thumb—

Roggin's Latches, with screw..*doz. 35@40¢*

Door—

Allith Mfg. Co., Reliable and Alligator, 50%; Reliable Cold Storage, 50%
Cronk & Carrier Mfg. Co., No. 101, ₱ doz. $2.00
Richards' Bull Dog, Heavy, No. 125.....50&5%
Richards' Trump, No. 127.....$1.50

Leaders, Cattle—

Small.....*doz. 50¢; large, 60¢*
Covert Mfg. Co.:
Cotton, 45%; Hemp, 45%; Jute, 35%; Sisal, 20%.

Leathers, Pump—

See *Pumps—*

Lifters, Transom—

R. & E.....10%

Lines—

Wire Clothes, Nos.	*18*	*19*	*20*
100 feet.....	*$2.50*	*2.25*	*2.00*
75 feet.....	*$2.10*	*1.80*	*1.65*

Emerson Cordage Works:
Solid Braided Chalk, Nos. 0 to 3..40%
Solid Braided Masons'.....30%
Silver Lake Braided Chalk, No. 0, $6.00; No. 1, $6.50; No. 2, $7.00; No. 3, $7.50.....₱ gr. 20%
Masons' Lines, Shade Cord, &c.: White Cotton, No. 3½, $1.50; No. 4, $2.00; No. 4½, $2.50; Colors, No. 3½, $1.75; No. 4, $2.25; No. 4½, $2.75; Linen, No. 3½, $2.50; No. 4, $3.50; No. 4½, $4.50.....20%
Tent and Awning Lines: No. 5, White Cotton, $7.50; Drab Cotton, $8.50.....20%
Clothes Lines, White Cotton: 50 ft., $2.75; 60 ft., $3.25; 70 ft., $3.75; 75 ft., $4.00; 80 ft., $4.25; 90 ft., $4.75; 100 ft., $5.25.....20%
Turner & Stanton Co.:
Solid Braided Chalk, Masons' and Awning Lines.....40%
Clothes Lines White Cotton.....20%
Shade Cord, Cotton or Linen....20%

Locks— Cabinet—

Cabinet Locks.....*33⅓%*

Door Locks, Latches, &c.—

NOTE.—Net Prices are very often made on these goods.
Reading Hardware Co.....40%
R. & E. Mfg. Co.....10%

Padlocks—

R. & E. Mfg. Co. Wrought Steel and Brass.....75&10%

Sash, &c.—

Ives' Patent:
Bronze and Brass, 55&5%; Crescent, 60%; Iron, 60%; Window Ventilating, 40&20%; Robinson Pat. Ventilating Sash Lock, 33⅓%.
Pullman Patent Ventilating Lock..35%
Reading Sash Locks.....40%

Machines—Boring—

Com. Upr't, without Augers, *$2.00@2.25*
Com. Angl'r, without Augers, *$2.25@2.50*
Swan's Improved.....40&10%
Jennings', Nos. 1 and 4.....25&7½%
Millers' Falls.....5.75
Snell's, Upright, $2.65; Angular, $2.90

Corking—

Reisinger Invincible Hand Power....₱ doz. $18.00

Fence—

Williams' Fence Machines....each, $5.50

Hoisting—

Moore's Anti-Friction Chain Hoist.30%
Moore's Hand Hoist, with Lock Brake.....20%
Moore's Cyclone, High Speed Chain Hoist.....25%

Ice Cutting—

Chandler's.....12½%

Washing

Boss Washing Machine Co.:	Per doz.
Boss No. 1	$57.00
Boss Rotary	$57.00
Champion Rotary Banner No. 1	$57.00
Standard Champion No. 1	$50.00
Standard Perfection	$27.00
Cincinnati Square Western	$33.00
Uneeda American, Round	$33.60

Mallets—

Hickory.....*45&5@50%*
Lignumvitæ.....*45&5@50%*
Tinners' Hickory and Applewood.....*doz. 45&5@50%*

Mangers, Stable—

Swett Iron Works.....50%

Mats, Door—

Elastic Steel (W. G. Co.), new list.50%
Keystone Wire Matting Co.:
Keystone.....50%
Ideal.....50%

Mattocks—

See *Picks and Mattocks.*

Milk Cans—See *Cans, Milk.*

Mills, Coffee, &c.—

Enterprise Mfg. Co.....20@25%
National list Jan. 1, 1902.....50%
Parker's Columbia and Victoria..33⅓%
Parker's Box and Side.....50&10%
Swift, Lane Bros. Co.....30%

Motors, Water—

Divine's Red Devil.....30%
Lippincott's.....30%

Mowers, Lawn—

NOTE.—Net prices are generally quoted
Cheapest.....*all sizes, $4.50@4.90*
Cheap.....*all sizes, $2.00@2.50*
Better Grade..*all sizes, $2.50@4.50*

	12	*14*	*16*	*18-in.*
High Grade	*$4.50*	*4.75*	*5.00*	*5.25*

Continental.....60%
Great American.....70%
Great American Ball Bearing, new list.70%
Quaker City.....70%
Pennsylvania.....60%
Pennsylvania, Jr., Ball Bearing, 50&10&5%
Pennsylvania Golf.....50%
Pennsylvania Horse.....33⅓&5%
Pennsylvania Pony.....40&5%
Granite State:
Style A, Low Wheel.....70%
Style B, Low Wheel.....70%
Style C, High Wheel, spcl. list, 70&10%
Style D, High Wheel, spcl. list..70%
Philadelphia:
Styles M., S., C., K., T....70&10&5%
Style A, all Steel.....60&10&5%
Style B, High Wheel.....70&10&5%
Drexel and Gold Coin, special list.40%
Horse.....40&5%
Pony.....40&5%
36-in. Horse.....30&10%
Eagle Horse.....30&5%
I. X. L. Horse.....50%

Nails—

Wire Nails and Brads, Miscellaneous.....*87½@87½&10%*
Cut and Wire. See *Trade Report.*
Hungarian, Finishing, Upholsterers' &c. See *Tacks.*

Horse—

Nos.	6	7	8	9	10	
Anchor	23	21	20	19	18	...40&5%
Coleman	13	12	12	11	11	.....net
New Haven..	23	21	20	19	18	...40&5%
Livingston	19	18	17	16	16	.....10%

Western.....₱ lb. 8½¢
Jobbers' Special Brands.....*per lb.9@10¢*

Picture—

	1½	*2*	*2½*	*3*	*4in.*
Brass H'd	*.45*	*.55*	*.60*	*.70*	*.. gro*
Por. Head	*... 1.10*	*1.10*	*1.10*		*.. gro*

Nippers—

See *Pliers and Nippers.*

Nuts—

Cold Punched: *Off list.*
Square, Blank or Tapped..*4.80¢*
Hexagon, Blank or Tapped..*5.10¢*
Square, Blk, C., T. & R...*5.10¢*
Hexagon, Blk, C., T. & R.*5.70¢*
Hot Pressed:
Square, Blank.....*5.30¢*
Hexagon, Blank.....*5.70¢*
Square, Tapped.....*5.20¢*
Hexagon, Tapped.....*5.60¢*

Oakum—

Best.....*lb.. 6½¢*
U. S. Navy.....*lb., 6¢*
Navy.....*lb., 5¢*
Plumbers' Spun Oakum.....*5½¢*
In carload lots ¼¢ lb off, f.o.b. New York.

Oil Tanks—See *Tanks, Oil.*

Oilers—

Steel, Copper Plated.....*75%*
Chase or Paragon:
Brass and Copper.....*50&10%*
Zinc.....*65&10%*
Malleable, Hammers' Improved, Nos. 11, 12 and 13, 20%; Old Pattern, Nos. 1, 2, 3, 50%.
American Tube & Stamping Co.:
Spring Bottom Cans.....70&10&10%
Railroad Oilers, &c.....60&60&10%

Openers— Can— *Per doz.*

Sprague, Iron Handle....*30@35¢*
Sprague, Wood Handle...*35@40¢*
Sardine Scissors.....*$1.75@$3.00*
Yankee Can and Bottle Opener, ₱ doz., net, $0.75; Little Gem, ₱ doz., net.....$0.65

Egg—

Hartigan Nickel Plate, ₱ doz., $2.00; Silver Plate, $4.00.

Packing—

Asbestos Packing, Wick and Rope.....*20@25¢*

Rubber—

(Fair quality goods.)

Sheet, C. I.....*11@12¢*
Sheet, C. O. S.....*11@12¢*
Sheet, C. B. S.....*12@13¢*
Sheet, Pure Gum.....*40@45¢*
Sheet, Red.....*40@50¢*
Jenkins' '96, ₱ lb. 80¢.....25%

Miscellaneous—

American Packing...*lb. 7@10 ¢*
Cotton Packing.....*lb. 16@25 ¢*
Italian Packing.....*lb. 9@12½¢*
Jute.....*lb. 4@ 4½¢*
Russia Packing.....*lb. 8@11 ¢*

Pails, Water, Well, &c.—

See *Buckets.*

Pans— Dripping—

Standard List.....*65&7½@70%*
Edwards, Royal Blue.....65&7½%

Fry—

Common Lipped:

Nos.	*1*	*2*	*3*	*4*	*5*
Per doz	*$0.75*	*0.80*	*0.90*	*1.10*	*1.30*

Refrigerator, Galva.—

Inch	*12*	*14*	*16*	*18*
Per doz	*$1.75*	*2.25*	*2.80*	*3.15*

Paper—Building Paper

Asbestos: *lb.*
Roll Board or Building Felt, 6 to 30 lb., per 100 sq. ft.3½@5¢
Roll Board or Building Felt, 3-32 and ⅛ in., 45 to 60 lb., per 100 sq. ft.....*6¢*
Mill Board, Sheet, 40 x 40 in., 1-32 to ½ in.....*3@5¢*
Per roll
Rosin Sized Sheathing: 500 sq. ft. Light weight, 25 lbs. to roll *$3@58¢*
Medium weight, 30 lbs. to *56@70¢*
Heavy weight, 40 lbs. to *75@78¢*
Black Water Proof Sheathing, 500 sq. ft., 1 ply, 65¢; 2 ply, 85¢; 3 ply, $1.10; 4 ply, $1.25.
Deafening Felt, 9, 6 and 4½ sq. ft. to lb. ton.....*$35.50*
Red Rope Roofing, 250 sq. ft. per roll.....*$1.75*

Tarred Paper—

1 ply (roll 400 sq. ft.), ton....*$34.00@$38.00*
2 ply, roll 198 sq. ft.....*65¢*
3 ply, roll 198 sq. ft.....*88¢*
Slater's Felt (roll 500 sq. ft.)..*80¢*

Sand and Emery—

Flint Paper and Cloth.50&10@—%
Garnet Paper and Cloth....*25%*
Emery Paper and Cl'h..50&10@60%

Parers— Apple—

Goodell Co.:
Family Bay State.....₱ doz, $15.00
Improved Bay State.....₱ doz. $36.00
New Lightning.....₱ doz. $7.00
Turn Table '98.....₱ doz. $6.00
White Mountain.....₱ doz. $5.00
Bonanza Improved.....each $7.50
Dandy.....each $10.00
Eureka Improved.....each $20.00
New Century.....each $20.00
Ranger.....each $25.00
Livingston Nail Co.:
Daisy.....₱ doz. $4.00
Little Star.....₱ doz. $5.00
Rocking Table.....₱ doz. $6.20
Reading Hardware Co.:
Advance.....₱ doz. $4.00
Baldwin.....₱ doz. $4.00
Reading 72.....₱ doz. $3.25
Reading 78.....₱ doz. $6.25

Potato—

Saratoga.....₱ doz. $7.00
White Mountain.....₱ doz. $6.00

Picks and Mattocks—

List, Feb. 23, 1899..70&10@70&10&5%
Cronk's Handled Garden Mattock, ₱ doz., No. 2, $2.60; No. 3, $2.40.

Pinking Irons—
See *Irons, Pinking.*

Pins, Escutcheon—
Brass .....50@50&10%
Iron, list Nov. 11, '05..60@60&10%

Pipe, Cast Iron Soil—
Standard, 2-6 in.....60&10@—%
Extra Heavy, 2-6 in..70&10@—%
Fittings, Standard and Heavy, 75&10@—%

Pipe, Merchant—

	Consumers, Carloads. Steel. Blk.	Galv.	Iron. Blk.	Galv.
	%	%	%	%
⅛ & ¼ in...	61	48	57	41
⅜ in.....	66	52	59	41
½ in.....	68	56	61	49
¾ to 6 in....	72	62	66	56
7 to 12 in....	69	54	61	46

Pipe, Vitrified Sewer—
Carload lots.
Standard Pipe and Fittings, 3 to 24 in., f.o.b. factory:
First-class 82%
Second-class 85%

Pipe, Stove—

	Per 100 joints. C. L.	L. C. L.
Edwards' Nested:		
5 in., Standard Blue....	$6.25	$7.25
6 in., Standard Blue....	6.75	7.75
7 in., Standard Blue....	7.75	8.75
5 in., Royal Blue.....	7.00	8.00
6 in., Royal Blue.....	7.50	8.50
7 in., Royal Blue.....	8.50	9.50
Wheeling Corrugating Co.'s Nested:		
5 in., Uniform Color..	$6.15	$7.15
6 in., Uniform Color..	6.65	7.65
7 in., Uniform Color..	7.65	8.65

Planes and Plane Irons—

Wood Planes—
Bench, first qual.....30@30&10%
Bench, second qual...40@40&10%
Molding .....25@25&10%
Chapin-Stephens Co.:
Bench, First Quality.....30%
Bench, Second Quality.....40%
Molding and Miscellaneous.....25%
Toy and German.....30%
Union 60%

Iron Planes
Chaplin's Iron Planes.....50&10%
Union 60%

Plane Irons—
Wood Bench Plane Irons, list Dec. 12, '06.....25%
Buck Bros.....30%
Chapin-Stephens Co.....25%
Union 50%
L. & I. J. White.....20&5@25%

Planters, Corn, Hand—
Kohler's Eclipse.....⅌ doz. $8.00

Plates—
Felloe .....lb. 4@4¼¢

Pliers and Nippers
Button Pliers.....75@75&10%
Gas Burner, per doz., 5 in., $1.25 @ $1.30; 6 in., $1.45 @ $1.50.
Gas Pipe.. 7 8 10 12-in.
$2.00 $2.25 $2.75 $3.50
Acme Nippers.....50&5%
Cronk & Carrier Mfg. Co.:
American Button.....80%
Improved Button.....75&10%
Cronk's 60%
No. 80 Linemen's.....50%
Stub's Pattern.....45%
Combination and others.....33⅓%
Heller's Farriers' Nippers, Pincers and Tools.....40&5@40&10&5%
P., S. & W. Tinners' Cutting Nippers 40%
Wm. Schollhorn Co.:
Bernard, 35%; Elm City, 35%; Paragon, 50%; Lodi, 55%.
Swedish Side, End and Diagonal Cutting Pliers.....50%
Utica Drop Forge & Tool Co.:
Pliers and Nippers, all kinds.....40%

Plumbs and Levels—
Chapin-Stephens Co.:
Plumbs and Levels.....30@30&10%
Chapin's Imp. Brass Cor..40@40&10%
Pocket Levels.....30@30&10%
Extension Sights.....30@30&10%
Machinists' Levels.....40@40&10%
Disston's Plumbs and Levels....60&10%
Disston's Pocket Levels.....60&10%
Stanley's Duplex.....38%
Woods' Extension.....33⅓%

Points, Glaziers'—
Bulk and 1-lb. papers...lb. 9½¢
½-lb. papers.....lb. 10 ¢
¼-lb. papers.....lb. 10½¢

Police Goods—
Manufacturers' Lists...25@25&5%
Tower's 25%

Polish—Metal, Etc—
Prestoline Liquid, No. 1 (½ pt.), ⅌ doz., $3.00; No. 2 (1 qu.), $9.00..40%
Prestoline Paste.....60%
George William Hoffman:
U. S. Metal Polish Paste, 3 oz. boxes, ⅌ doz. 50¢; ⅌ gro. $4.50; ½ lb boxes, ⅌ doz. $1.25; 1 lb boxes, ⅌ doz. $2.25.
U. S. Liquid, 8 oz. cans, ⅌ doz., $1.25.
Barkeepers' Friend Metal Polish, ⅌ doz., $1.75.

Stove—
Black Eagle Benzine Paste, 5 lb cans, ⅌ lb 10¢
Black Eagle, Liquid, ½ pt. cans.. ⅌ doz. 75¢
Black Jack Paste, ¾ lb cans, ⅌ gr. $9.00
Black Kid Paste, 5 lb can....each, $0.65
Ladd's Black Beauty Liquid, per 100 tins.....$6.75
Joseph Dixon's, ⅌ gr. $5.75.....10%
Dixon's Plumbago.....⅌ lb 8¢
Fireside .....⅌ gr. $2.50
Gem, ⅌ gr. $1.50.....10%
Japanese .....⅌ gr. $3.50
Jet Black.....⅌ gr. $3.50
Peerless Iron Enamel, 10 oz. cans.. ⅌ doz. $1.50

Poppers, Corn—
1 qt. Square..doz.$0.88; gro.$8.75
1 qt. Round..doz.$1.00; gro.$10.00
1½ qt. Square..doz.$1.10; gro.$11.00
2 qt. Square..doz.$1.35; gro.$13.50

Post Hole and Tree Augers and Diggers—
See also *Diggers, Post Hole, &c.*

Posts, Steel—
Steel Fence Posts, each, 5 ft., 42¢; 6 ft., 46¢; 6½ ft., 48¢.
Steel Hitching Posts.....each $1.30

Potato Parers—
See *Parers, Potato.*

Pots, Glue—
Enameled .....35&10%
Tinned .....30&10%

Powder—
In Canisters:
Duck, 1 lb.....each 45¢
Fine Sporting, 1 lb....each 75¢
Rifle, ½-lb.....each 15¢
Rifle, 1-lb.....each 25¢
In Kegs:
12½-lb. kegs.....$3.50
25-lb. kegs.....$4.50
King's Semi-Smokeless:
Keg (25 lb bulk).....$6.50
Half Keg (12½ lb bulk).....$3.50
Quarter Keg (6¼ lb bulk).....$1.90
Case 24 (1 lb cans bulk).....$8.50
Half case (1 lb cans bulk).....$4.50

King's Smokeless:	Shot Gun.	Rifle.
Keg (25 lb bulk).....	$12.00	$15.00
Half Keg (12½ lb bulk)...	6.25	7.75
Quarter Keg (6¼ lb bulk).	3.25	4.00
Case 24 (1 lb cans bulk)..	14.00	17.00
Half case 12 (1 lb c. bk)..	7.25	8.75

Presses—

Fruit and Jelly—
Enterprise Mfg. Co.....20@25%

Seal Presses—
Morrill's No. 1, ⅌ doz., $20.00.....50%

Pruning Hooks and Shears
See *Shears.*

Pullers, Nail—
Cyclops 50%
Miller's Falls, No. 3, ⅌ doz., $12.00..33⅓&10%
Morrill's No. 1, Nail Puller, ⅌ doz. $20.00 .....50%
Pearson No. 1, Cyclone Spike Puller, each $30.00.....50%
The Scranton Co. Case Lots:
No. 2B (large).....$5.50
No. 3B (small).....$5.00
Smith & Hemenway Co.:
Diamond B.....70%
Giant 50%
Staple Pullers, Utica and Davison 60%

Pulleys, Single Wheel—

Inch	1½	1¾	2	3
Awning or Tackle, doz.	$0.30	.45	.60	1.05
Hay Fork, Swivel or Solid Eye. doz., ¼ in., $1.25; 5 in., $1.55				
Inch	2	2¼	2½	
Hot House, doz...	$0.65	.85	1.20	
Inch	1¼	1½	1¾	2
Screw, doz....	$0.16	.19	.23	.30
Inch	1¾	2	2¼	2½
Side, doz.....	$0.25	.40	.55	.60
Inch	1½	1¾	2	2½

Sash Pulleys—
Common Frame; Square or Round End, per doz, 1¾ and 2 in.....17@20¢
Auger Mortise, no Face Plate, per doz., 1¾ and 2 in....20@21c
Acme, No. 35..1¾ in., 19¢; 2 in., 20½¢
American Pulley Co.:
Wrought Steel American Plain Axle .....50&10%
Wrought Steel, Eagle.....17@20¢
Fox-All-Steel, Nos. 3 and 7, 2 in.... ⅌ doz. 80%
Grand Rapids All Steel Noiseless..50%
Niagara, No. 25, 1¾ in., 19¢; 2 in.....20½¢
No. 26, Troy..1¾ in., 14½¢; 2 in., 16½¢
Star, No. 26..1¾ in., 19¢; 2 in., 20½¢
Tackle Blocks—See Blocks.

Pumps—
Cistern 60%
Pitcher Spout.....75&5@75&10%
Wood Pumps, Tubing, &c....50%
Barnes Dbl. Acting (low list)....40&5%
Barnes Pitcher Spout.....75&5%
Contractors' Rubber Diaphragm, No. 2, R. & L. Block Co.....$16.00
Daisy Spray Pump.....⅌ doz. $6.50
Flint & Walling's Fast Mail Hand, (low list).....50%
Flint & Walling's Fast Mail (low list) 50%
Flint & Walling's Tight Top Pitcher, 75&10%
National Specialty Mfg. Co., Measuring, Nos. 2, $6.00; 3, $5.50.....30%
Myers' Pumps (low list).....40&5%
Myers' Power Pumps.....40&5%
Myers' Spray Pumps.....40&5%

Pump Leathers—
Lower Valve Leathers—Per gro.:

Inch....	2	2½	3	3½	4
	$3.10	3.70	4.35	4.95	5.60

Crimped Plunger Leathers—Per 100:

Inch.....	2½	3	3½	4
	$4.15	5.25	7.80	9.65

Punches—
Saddlers' or Drive, good..... doz. 50@75¢
Spring, single tube, good quality $1.75
Revolving (4 tubes)....doz.$3.60
Bemis & Call Co.'s Cast St'l Drive.50%
Morrill's Nos. 1AA, 1A, 1B, 1C, 1D, $15.00.....50%
Hercules, 1 die, each $5.00.....50%
Niagara Hollow Punches.....40%
Niagara Solid Punches.....55&10%
Wm. Schollhorn Co.:
Belt and Ticket, Bernard, 35%; Paragon, 50%; Lodi.....55%
Tinners' Hollow, P., S. & W. Co..40%
Tinners' Solid, P., S. & W. Co., ⅌ doz., $1.44.....40%

Rail—Barn Door, &c.—
Sliding Door, Painted Iron.... 2½@2¾¢
Sliding Door, Wrought Brass, 1⅛ in., lb., 36¢ 30%
Allith Mfg. Co.: Reliable Hanger Track 50%
Cronk's:
Double Braced Steel Rail..⅌ ft. 3¼ ¢
O. N. T. Rail.....$3.12
Griffin's:
xxx, ⅌ 100 ft., 1 x 3-16 in., $3.25; 1¼ x 3-16 in., $3.75.
Hinged Hanger, ⅌ 100 ft., 1 x 3-16 in., $3.50; 1¼ x 3-16 in., $4.00.
Lane's:
Hinged Track, ⅌ 100 ft. $3.45
O. N. T. ⅌ 100 ft., 1 in., $3.00; 1⅛ in., $3.45; 1½ in., $4.00.
Standard, 1⅛ in.....⅌ 100 ft. $4.00
Lawrence Bros.:
1 x 3-16 in., ⅌ 100 ft., $7.50; 1¼ x 3-16 in., $8.75.....55&7½%
McKinney's:
Hinged Hanger Track, ⅌ ft., 11¢, 60&5%
1 x 3-16 Track.....55&7½%
Myers' Stayon Track.....60&5%
Richards' Mfg. Co.:
Common, 1 x 3-6 in., $3.00; 1⅛ x 3-16, $3.25; 1¼ x 3-16, $3.50.
Special Hinged Hanger Rail...60&10%
Lag Screw Rail, No. 65.....50%
Gauge Trolley Track, ⅌ ft., No. 31, 9¢; No. 32, 14¢; No. 33, 20¢.
No. 50.....60&10%
Nos. 61, $3.00; 62, $3.25; 63, $3.50; 64, $4.00; 45, $3.25; 46, $3.50; 49, No. 1, $3.25; 49, No. 2, $3.50.

Rakes—
NOTE.—Many goods are sold at net prices.
Fort Madison Red Head Lawn....$3.25
Fort Madison Blue Head Lawn....$2.70
Cronk's:
Steel Garden; Champion, 75%; Ideal, 80%; Victor.....80&25%
Queen City Lawn, ⅌ doz., 20 teeth, $2.85; 24, $3.00.....net
Anticlog Lawn, ⅌ doz.....$4.00
Malleable Garden.....70&10%
Ideal Steel Garden, ⅌ doz., 12 teeth, $15.00; 14, $16.00; 16, $18.00.....80%
Kohler's:
Lawn Queen, 20-tooth....⅌ doz. $3.15
Lawn Queen, 24-tooth....⅌ doz. $3.25
Paragon, 20-tooth.....⅌ doz. $2.70
Paragon, 24-tooth.....⅌ doz. $2.75
Steel Garden, 14-tooth....⅌ doz. $2.40
Malleable Garden, 14-tooth, ⅌ doz. $2.00@2.25

Rasps, Horse—
Disston's 75%
Heller Bros.'.....70&5@70&10&5%
Liveright Bros.' Gold Medal.70&10@75%
McCaffrey's American Standard, 60&10&5%
New Nicholson.....70&10@75%
See also Files.

Razors—
Liana Bo-ras-ic.....60%
Fox Razors, ⅌ doz., No. 42, $9.00; No. 44, $20.00; No. 82, Platina, $25.00. } 10%
Red Devil.....65%

Reels, Fishing—
Hendryx:
M 6, Q 6, A 6, B 6, M 9¼, M 16, Q 16, A 16, B 16, 4008, Rubber, Populo, Nickeled Populo.....20%
Aluminum, German Silv., Bronze.25%
1240 N, 124 N.....20%
3004 N, 06 N, 6 RM, G 8.....25%
4 N, 6 PN, 24 N, 26 PN.....20%
2904 P, 33¼%; 2904 PN, 33¼%; 0924 N, 33¼%; 02084 N, 33¼%; 002904 PN, 33¼%; 802 N, 33¼%.....25%
986 PN, 2904 N, 974 PN.....25%
5009 PN, 5009 N.....20%
Competitor, 102 P, 102 PN, 202 P, 202 PN, 102 PR, 202 PR.....20%
304 P, 304 PN, 00304 P, 00304 PN.33⅓%

Registers—*List July 1, 1903.*
Japanned, Electroplated and Bronzed 66⅔%
White Porcelain Enamel....60%
Solid Brass or Bronze Metal..25%

Revolvers—
Single Action.....95¢@$1.00
Double Action, except 44 cal..$2.00
Double Action, 44 caliber....$2.00
Automatic $4.00
Hammerless $4.50

Riddles, Hardware Grade
16 in.....per doz.$2.50@$2.75
17 in.....per doz.$2.75@$3.00
18 in.....per doz.$3.00@$3.25

Rings and Ringers—Bull Rings—

	2	2½	3 inch.
Steel	$0.70	0.75	0.80 doz.
Copper	$1.20	1.40	1.80 doz.

Hog Rings and Ringers—
Hill's Rings, gro. boxes....$4.25
*Hill's Ringers, Gray Iron, doz.*60¢
*Hill's Ringers, Malleable I doz.*80¢
Blair's Rings.....per g
Blair's Ringers.....per doz.75¢
Brown's Rings.....per gro.$5.25
Brown's Ringers....per doz.75¢

Rivets and Burrs—
Copper .....40&10@50%
Carriage, Coopers', Tinners, &c.: Black .....70&10%
Metallic Tinned.....70%

Bifurcated and Tubular—
Assorted in Boxes.
Bifurcated, per doz. boxes, pasteboard boxes, 50 count, 23@25¢; Tin boxes, 100 count, 29@32¢.
Tubular, per doz. boxes, 50 count, 29@32¢; 100 count, 51@58¢.

Rollers—
Cronk's Stay, No. 50.....$1.00
Cronk's Bronze Bell, No. 55, $0.60; No. 56, $0.75; No. 60.....$0.75
Lane's Stay.....40%
Richards' Stay:
Handy Adj. and Reversible No. 53.75¢
O. K. Adj. and Reversible No. 58.50¢
Lag Screw, Nos. 55 and 57.....50%
Underwriters', Nos. 59, 60.....50%
Favorite, No. 54.....60%

Rope—
Manila, 7-16 in. diam. and larger: Pure .....lb., 13@13½¢
Sisal, 7-16 in. diam. and larger: Pure .....lb., 9¼¢
Sisal, 7-16 in. diam. and larger: No. 2 quality.....lb., 7¾@8¢
Sisal, Hay, Hide and Bale Ropes, Medium and Coarse: Mixed .....lb., 7¾@8¢
Pure .....lb., 9¼¢
Sisal, Tarred, Medium Lath Yarn, Coarse and Untarred: Mixed .....lb., 7@7½¢
Pure .....lb., 8¢
Cotton Rope: Best, ¼-in. and larger...18@20¢
Medium, ¼-in. and larger.16@17¢
Common, ¼-in. and larger..10¢
In coils, ½¢ advance.
Jute Rope: Thread, No. 1, ¼-in. & up, lb., 8 to 8½¢
Thread, No. 2, ¼-in. & up, lb., 7½ to 8¢

Wire Rope—
Galvanized .....$7½@8½%
Plain .....45@52½%

Ropes, Hammock—
Covert Mfg. Co.:
Jute, 35%; Sisal.....20%

Rules
Boxwood .....60@60&10%
Ivory .....35&10@35&10&5%
Chapin-Stephens Co.:
Boxwood 60%
Flexifold 40%
Ivory .....25@25&10%
Miscellaneous .....50@50&10%
Stephens' Combination.....55%
Stationers' .....50@50&10%
Keuffel & Esser Co.:
Folding, Wood.....35&10%
Folding, Steel.....33⅓&10%
Lufkin's Steel.....50&10%
Lufkin's Lumber.....50&10%
Unson Nut Co.:
Boxwood .....60@60&10%
Ivory .....35&10@35&10&10%

Sash Balances—
See *Balance, Sash.*

Sash Locks—See *Locks, Sash.*

Sash Weights—
See *Weights, Sash.*

Sausage Stuffers or Fillers
See *Stuffers or Fillers, Sausage.*

Saw Frames—
See *Frames, Saw.*

Saw Sets—See *Sets, Saw.*

Saw Tools—See *Tools, Saw.*

Saws—

Atkins':
Circular 45%
Band ..... 50@50&10%
Butcher Saws 50%
Cross Cuts 35%
One-Man Cross Cut 40%
Narrow Cross Cut 50%
Hand, Rip and Panel ..... 35&5%
Miter Box and Compass 40%
Mulay, Mill and Drag 45%
Wood Saws ..... 40&10%
Chapin-Stephens Co.:
Turning Saws and Frames ..30@30&10%
Diamond Saw & Stamping Works:
Sterling Kitchen Saws ..... 30&10&10%
Disston's:
Circular, Solid and Ins'ted Tooth. 50%
Band, 2 to 18 in. wide 60%
Band, ¼ to 1¾ 40%
Crosscuts 45%
Narrow Crosscuts 50%
Mulay, Mill and Drag 50%
Framed Woodsaws 25%
Woodsaw Blades 25%
Woodsaw Rods, Tinned 15%
Hand Saws, Nos. 12, 99, 9, 16, d100, 18, 120, 76, 77, 8 ..... 25%
Hand Saws, Nos. 7, 107, 107½, 3, 1, 0, 00, Combination 30%
Compass, Key Hole, &c. 25%
Butcher Saws and Blades 30%
C. E. Jennings & Co.'s:
Back Saws 16%
Butcher Saws ..... 25&7½%
Compass and Key Hole Saws, 33⅓&7½%
Framed Wood Saws ..... 25&7½%
Hand Saws 12½%
Wood Saw Blades ..... 33⅓&7½%
Millers Falls:
Butcher Saws ..... 15&10%
Star Saw Blades ..... 15&10%
Massachusetts Saw Works:
Victor Kitchen Saws ..... 40&10&50%
Butcher Saws Blades ..... 35@40%
Peace & Richardson's Hand Saws ..30%
Simonds':
Circular Saws 45%
Crescent Ground Cross Cut Saws. 30%
One-Man Cross Cuts ..... 40&10%
Gang Mill, Mulay and Drag Saws. 45%
Band Saws 50%
Back Saws ..... 25@25&7½%
Butcher Saws ..... 35@35&7½%
Hand Saws ..... 25@25&7½%
Hand Saws, Bay State Brand 45%
Compass, Key Hole, &c. ..25@25&7½%
Wood Saws ..... 40&7½%
Wheeler, Madden & Clemson Mfg. Co.'s Cross Cut Saws 50%

Hack Saw Blades and Frames—

Atkins' Hack Saw Blades A A A..25%
Disston's:
Concave Blades 25%
Keystone Blades 35%
Hack Saw Frames 30%
Simonds File Co. 35%
C. E. Jennings & Co.'s:
Hack Saw Frames, Nos. 175, 180 ..... 40&7½%
Hack Saws, Nos. 175, 180, complete, 40&7½%
Goodell's Hack Saw Blades ..... 40&10%
Griffin's Hack Saw Frames ..35&5&10%
Griffin's Hack Saw Blades ..... 35&5&10%
Star Hack Saws and Blades ..... 15&10%
Sterling Hack Saw Blades ..... 30&10&5%
Sterling Hack Saw Frames ..30&10&10%
Sterling Power Hack Saw Machines, each, No. 1, $25.00; No. 2, $30.00..10%
Victor Hack Saw Blades 20%
Victor Hack Saw Frames 40%

Scroll—

Barnes, No. 7, $15 ..... 25%
Barnes' Scroll Saw Blades 40%
Barnes' Velocipede Power Scroll Saw, without boring attachment, $18; with boring attachment, $20 ..... 20%
Lester, complete, $10.00 ..... 15&10%
Rogers, complete, $3.50 and $4.00.. 15&10%

Scales—

Family, Turnbull's ....50@50&10%
Counter:
Hatch, Platform, ½ oz. to ¼ lbs. ..... doz., $5.50
Two Platforms, ½ oz. to 8 lbs. ..... doz., $16.00
Union Platform, Plain. $1.70@1.90
Union Platform, Stpd. $1.85@2.15
Chatillon's:
Eureka 25%
Favorite 40%
Grocers' Trip Scales 50%
The Standard Portables 40%
The Standard R. R. and Wagon ..... 50&10%

Scrapers—

Box, 1 Handle ..... doz. $2.00@2.25
Box, 2 Handle ..... doz. $2.50@2.60
Ship .... Light, $2.00; Heavy, $2.50
Chapin-Stephens Co., Hox..30@30&10%
Richards Mfg. Co., Foot 60%

Screws—Bench and Hand

Bench, Iron, doz., 1 in., $2.50@2.75; 1⅛, $3.00@3.25; 1¼, $3.50@3.75
Bench, Wood ..... 20@20&10%
Hand, Wood ...70&10@70&10&10%
Chapin-Stephens Co., Hand ..... 70@70&10&2½%

Coach, Lag and Hand Rail—

Lag, Cone Point ..... 75&10&10%
Coach, Gimlet Point ...75&10&5%
Hand Rail ..... 70&10@75%

Jack Screws—

Standard List ..... 70&10@75%
Millers Falls ..... 50&10&10%
Swett Iron Works ..... 70@75%

Machine—

Cut Thread, Iron, Brass or Bronze:
Flat Head or Round Head, 50@50&10%
Fillister Head ..... 40@40&10%
Rolled Thread, F. H. or R. H., Iron ..... 75&10%
F. H. or R. H., Brass, Nos. 8 to 14 ..... 65&10%

Set and Cap—

Set (Iron) ..... 75&10&7½%
Set (Steel), net advance over Iron 25%
Sq. Hd. Cap ..... 70&10&7½%
Hex. Hd. Cap ..... 70&10&7½%
Rd. Hd. Cap ..... 50&7½%
Fillister Hd. Cap ..... 60&7½%

Wood—

List July 23, 1903.
Flat Head, Iron ..... 87½&5@.. %
Round Head, Iron .... 85&5@.. %
Flat Head, Brass ..... 80&5@.. %
Round Head, Brass .. 77½&5@.. %
Flat Head, Bronze .... 75&5@.. %
Round Head, Bronze .72½&5@.. %
Drive Screws ..... 87½&5@.. %

Scroll Saws—

See *Saws, Scroll.*

Scythes—

Per doz.

Grass, No. 1, Plain .... $6.25@6.75
Clipper, Bronzed Webb. $6.50@7.00
No. 3 Clipper, Pol'd Webb. $6.75@7.25
No. 6 Clipper and Solid Steel, $7.00@7.50
Bush, Weed and Bramble, No. 2. $6.50@7.00
Grain, No. 1 ..... $8.25@8.75
Bronzed Webb, No. 1 ..$8.50@9.00
Nos. 3 and 4 Clipper, Grain .. $8.75@9.25
Solid Steel, No. 6 ..... $9.25@9.75

Seeders, Raisin—

Enterprise ..... 25@30%

Sets— Awl and Tool—

Fray's Adj. Tool Handles, Nos. 1, $12; 2, $18; 3, $12; 4, $9; 5, $7 ..... 50%
Millers Falls Adj. Tool Handles, No. 1, $12; No. 4, $12; No. 5, $18..20&10%

Garden Tool Sets—

Ft. Madison Three Plows, Hoe, Rake and Shovel ..... ℔ doz sets $9.00

Sets, Nail—

Octagon ..... gro. $3.50@3.75
Buck Bros. 27½%
Cannon's Diamond Point, ℔ gro, $12, 40&10%
Maybew's ..... ℔ gro. $9.00
Snell's Corrugated, Cup Pt. ....40&10%
Snell's Knurled, Cup Pt. ..... 40&10%
Victor Knurled Cup Pt. ... ℔ gro. $7.50

Rivet—

Regular list ..... 75@75&10%

Saw—

Atkin's:
Criterion 40%
Adjustable 40%
Disston's Star, Monarch and Triumph 30%
Morrill's No. 1 ..... $15.00
Nos. 3 and 4, Cross Cut $20.60
No. 5, Mill $30.00
Nos. 10, 11, 95 ..... $15.60
No. 1 Old Style $10.00
Special $16.25
Giant Royal Cross Cut ..... ℔ doz. $8.00
Royal, Hand ..... ℔ doz. $4.50
Taintor Positive ..... ℔ doz. $6.75

50%

Shaving—

Fox Shaving Sets, No. 30 ..... ℔ doz., net, $24.00
Smith & Hemenway Co.'s 75%

Sharpeners, Knife—

Pike Mfg. Co.:
Fast Cut Pocket Knife Hones, ℔ doz. $1.50
Mounted Kitchen Sand Stone, ℔ doz. $1.50
Natural Grit Carving Knife Hones, ℔ doz. $3.00
Quick Cut Emery Carving Knife Hones, ℔ doz. $1.50
Quick Edge Pocket Knife Hones, ℔ doz. $2.50

50%

Skate—

Smith & Hemenway Co., Eureka..50%

Shaves, Spoke—

Iron ..... doz. $1.10@1.25
Wood ..... doz. $1.75@2.25
Bailey's (Stanley R. & L. Co.) 45%
Chapin-Stephens Co. ..... 30@30&10%
Goodell's, ℔ doz. $9.00 ..... 15&10%

Shears—

Cast Iron.. 7	8	9 in.	
Best $16.00	18.00	20.00	*gro.*
Good ... $13.00	15.00	17.00	*gro.*
Cheap .. $5.00	6.00	7.00	*gro.*

Straight Trimmers, &c.:
Best quality Jap. ...70@70&10%
Best quality, Nickel..60@60&10%
Tailors' Shears ..... 40@40&10%
Acme Cast Shears ..... 40@40&5%
Heinisch's Tailor's Shears 10%
Wilkinson Shear & Cutlery Co.:
Sheep, 1900 list ..... 30&10&5%
Grass ..... 50&10%
Horse or Mule ..... 50&10%

Tinners' Snips—

Steel Blades ..... 20&5@20&10%
Steel Laid Blades ..... 40&10@50%
Forged Handles, Steel Blades, Berlin 50%
Heinisch's Snips 40%
Jennings & Griffin Mfg. Co.'s 6¼ to 10 in. ..... 33⅓&7½%
Niagara Snips 40%
P. S. & W. Forged Handles, 25%; W. R. W. ..... 40&10%

Pruning Shears—

Cronk's Hand Shears 33⅓%
Cronk's Wood Handle Shears 33⅓%
Disston's Combined Pruning Hook and Saw, ℔ doz. $18.00 ..... 25%
Disston's Pruning Hook only, ℔ doz. $12.00 ..... 25%
John T. Henry Mfg. Co.:
Pruning Shears, all grades 40%
P. S. & W. Co. ..... 40&10%
Columbian Cutlery Co.:
Hedge, Wilcut Brand ..... 60&10%
Lawn and Border, Wilcut Brand. 60&10%

Sheaves—Sliding Door—

Reading 40%
R. & E. list 15%

Sliding Shutter—

Reading list 40%
R. & E. list 10%

Shells—Shells, Empty—

Brass Shells, Empty:
Climax, 10 and 12 gauge ..... 65&10%
Club, Rival, 65&5%; First Quality, 60&5%

Paper Shells, Empty:
New Rapid, 10, 12, 16 and 20 gauge, 25&10%
Climax, 10 and 12 gauge; Acme, 10, 12, 16 and 20 gauge; Ideal, 10, 12, 16 and 20 gauge; Leader grade, 25&5%
Union, League, 12 and 12 gauge; Rival Grade 25%
New Climax, Defiance, 10, 12, 14, 16 and 20 gauge; Climax, 14, 16 and 20 gauge ..... 20&5%
Challenge, Monarch, 10, 12, 16 and 20 gauge; League, Union, 14, 16 and 20 gauge; Repeater Grade..20%
Expert, 10, 12, 16 and 20 gauge, 33⅓&5%

Shells, Loaded—

Loaded with Black Powder..40%
Loaded with Smokeless Powder, medium grade ..... 40&5%
Loaded with Smokeless Powder, high grade ..... 40&10&10%
Union Metallic Cartridge Co.:
New Club, Black Powders 40%
Nitro Club, Smokeless Powders. 40&5%
Arrow, Smokeless Powders. 40&10&10%
Winchester:
Smokeless Repeater Grade ..... 40&5%
Smokeless Leader Grade ...40&10&10%
Black Powder 40%

Shingles, Metal— Per Sq.

Edwards Mfg. Co.:

	Painted.	Galv.
14 x 20	$4.25	$6.00
10 x 14	4.50	6.25
7 x 10	4.75	6.50

Wheeling Corrugating Co.:

Dixie, 14 x 20 in.	$4.25	$5.50
Dixie, 10 x 14 in.	4.50	6.00
Dixie, 7 x 10 in.	5.00	6.75

Shoes, Horse, Mule, &c.—

F.o.b. Pittsburgh:
Iron ..... per keg. $4.10
Steel ..... per keg. $3.85
Burden's, all sizes ..... ℔ keg $3.90

Shot—

25-lb. bag.
Drop, up to 1 ..... $1.95
Drop, B and larger 2.20
Buck 2.20
Chilled 2.20
Dust 2.40

Shovels and Spades—

Association List, Nov. 15, 1902..40%
Avery Stamping Co. 40%

Snow Shovels—

Long Handle ..... $3.25@$3.50
Wood and Mail. D. Handle. $3.75@$4.00

Sieves and Sifters—

Hunter's Imitation ..... gro. $9.50@10.00
Hunter's Genuine ..... per gro. $12.00@12.50

Sifters, Ash—

Acme Ball Bearing Sales Co., Acme Automatic Ash Sifter, each, $3.25; ℔ doz. $39.00

Sieves, Seamless Metallic

	—Per dozen.—			
Mesh	*14*	*16*	*18*	*20*
Iron Wire	*$1.05*	*1.05*	*1.10*	*1.20*
Tinned Wire	*$1.15*	*1.15*	*1.20*	*1.30*

Sieves, Wooden Rim—

Nested, 10, 11 and 12 Inch.
Mesh 18, Nested .... doz. $0.90@0.95
Mesh 20, Nested .... doz. $1.00@1.05
Mesh 24, Nested .... doz. $1.30@1.40

Sinks, Cast Iron—

Painted, Standard list:
12 x 12 to 22 x 36 in. 60%
20 x 40 to 24 x 50 in. 50%
24 x 60 to 24 x 120 in. 30%
Barnes' low list:
Up to and including 20 x 36 in....50%
20 x 40 to 24 x 50 in. 45%
NOTE.—There is not entire uniformity in lists used by jobbers.

Skeins, Wagon—

Cast Iron ..... 70@75&10%
Steel ..... 40@45%

Slates, School—

Factory Shipments.
"D" Slates ..... 50@50&10%
Eureka, Unexcelled Noiseless .. 60&5 tens
Victor A, Noiseless .60&5 tens &5%

Slaw Cutters—See *Cutters.*

Snaps, Harness—

German ..... 40@40&10%
Covert Mfg. Co.:
Derby, 25%; Yankee, 30&2%; Yankee Roller, 30&2%
High Grade, 40%; Trojan 40%
Jockey 25%

Snaths—

Scythe ..... 55@60%

Snips, Tinners—See *Shears.*

Spoons and Forks—

Silver Plated—

Good Quality ..... 50&10@60&5%
Cheap ..... 60@60&10%
International Silver Co.:
1847 Rogers Bros., 40&10%; Rogers & Hamilton ..... 50&10%
Rogers & Bro., William Rogers' Eagle Brand ..... 50&10%
Anchor, Rogers Brand 60%
Wm. Rogers & Son ..... 60&10%

Miscellaneous

German Silver ..... 60@60&5%

Tinned Iron—

Teas ..... per gro. 50@55¢
Tables ..... per gro. $0.90@$1.00

Springs— Door—

Bardsley's Spring and Check 40%
Chicago (Coil) ..... 40&10%
Gem (Coil) 20%
Pullman (Coil) 35%
Reliance (Coil) ..... 40&10%
Star (Coil) 30%
Torrey's Rod, 30 in. ..... ℔ doz. $1.10

Carriage, Wagon, &c.—

1¼ in. and Wider: Per 100 lb.
Black ..... $4.75@$5.00
Half Bright ..... $4.75@$5.00
Bright ..... $5.25@$5.50
Painted Seat Springs:
1½ x 2 x 26 ..... per pr. 49@52¢
1½ x 3 x 28 ..... per pr. 73@77¢

Sprinklers, Lawn—

American Foundry & Mfg. Co.: Cactus, 65%; Japanese, 70%; National, ℔ doz. $12.00
Enterprise ..... 25@30%
Philadelphia No. 1, ℔ doz. $12; No. 2, $15; No. 3, $20 ..... 30%

Squares—

Nickel plated.. } List Jan. 5, 1900.
Steel and Iron.. } 75&10@80%
Rosewood Hdl. Try Square and T-Bevels ..... 60&10&10@70%
Iron Hdl. Try Squares and T-Bevels ..... 40&10@40&10&10%
Disston's Try Squares and Bevels, Rosewood Handle, 60&10%; Iron Stock and Bevel 15%

Squeezers, Lemon

Wood, Common, gro., No. 0, $5.25@$5.50; No. 1, $6.25@$6.50.
Wood, Porcelain Lined:
Cheap ..... doz. $1.00
Good Grade ..... doz. $1.25
Tinned Iron ..... doz. $0.75@1.25
Iron, Porcelain Lined ... doz. $1.75

Staples—

Barbed Blind ..... lb. 6@6½¢
Electricians', Association list .. 80&10&10&10%
Fence Staples, Plain, $2.15; Galvanized $2.45
Poultry Netting Staples ..... per lb. 3¼@3½¢

Steels, Butchers'—

Dick's 30%
Foster Bros. 30%

Steelyards— .... 30@30&10%

Stocks and Dies—

Blacksmiths' ..... 50@50&10%
Curtis Rev'ble Ratchet Die Stock..25%
Derby Screw Plates 25%
Green River 25%
Lightning Screw Plate 25%
Little Giant 25%
Reece's New Screw Plates 25%

Stoners, Cherry—

Enterprise ..... 25@30%

Stones—Oil, &c.

Pike Mfg. Co., 1907 list: ℔ lb
Arkansas St. No. 1, 3 to 5½ in. $2.80
Arkansas St. No. 1, 5½ to 8 in. $3.50
Arkansas Slips No. 1 ..... $4.00
Lily White Washita, 4 to 8 in. 60¢
Rosy Red Washita, 4 to 8 in. 60¢
Washita St., Extra, 4 to 8 in. 50¢
Washita St., No. 1, 4 to 8 in. 40¢
Washita St., No. 2, 4 to 8 in. 25¢
Lily White Slips ..... 90¢
Rosy Red Slips ..... 90¢
Washita Slips, Extra ..... 80¢
Washita Slips, No. 1 ..... 70¢
Washita Slips, No. 2 ..... 40¢

33⅓%

India Oil Stones (entire list) 33⅓%
Quickcut Emery and Corundum Oil Stone, Double Grit 40%
Quickcut Emery and Corundum Axe Stone, Double Grit 33⅓%
Quickcut Emery Rubbing Bricks..40%
Hindostan No. 1, R'g'lar, ℔ lb. 8¢
Hindostan No. 1, Small, ℔ lb 10¢
Axe Stones (all kinds) 33⅓%
Turkey Oil Stones, Extra, 5 to 8 in. ..... ℔ lb 80¢
Queer Creek Stones, 4 to 8 in. 20¢
Queer Creek Slips ..... 40¢
Sand Stone ..... 6¢

Scythe Stones—

Pike Mfg. Co., 1901 list:
Black Diamond S. S., ℔ gro. $12.00
Lamoille S. S., ℔ gro. $11.00
White Mountain S. S. ℔ gro. $9.00
Green Mountain S. S., ℔ gro. $6.00
Extra Indian Pond S.S. ℔ gro. $7.50
No. 1 Indian Pond S.S. ℔ gro. $7.00
No. 2 Indian Pond S.S. ℔ gro. $4.50
Leader Red End S. S. ℔ gro. $4.50
Quick Cut Emery, ℔ gro. $10.00
Pure Corundum, ℔ gro. $18.00
Crescent $7.00
Emery Scythe Rifles, 2 Coat, $8
Emery Scythe Rifles, 3 Coat, $10
Emery Scythe Rifles, 4 Coat, $12
} 33⅓%
Balance of 1904 list 33⅓%
Electro (Artificial), ℔ gro., $12.00 ..... 33⅓%
Lightning (Artificial), ℔ gro., $18.00 ..... 33⅓%

Stoppers, Bottle—

Victor Bottle Stoppers..... ℔ gro. $9.00

Stops— Bench—

Millers Falls..... 15&10%
Morrill's, ℔ doz., No. 1, $10.00..... 50%
Morrill's, No. 2, $12.50..... 60%

Door—

Chapin-Stephens Co..... 50@50&10%

Plane—

Chapin-Stephens Co..... 20%

Straps— Box—

Cary's Universal, case lots.... 20&10&10%

Stretchers, Carpet—

Cast Iron, Steel Points, dos. 60@60&10%
Socket ..... doz. $1.66
Excelsior Stretcher and Tack Hammer Combined, ℔ doz. $6.00..... 20%

Stuffers, Sausage—

Enterprise Mfg. Co..... 25@25&7½%
National Specialty Co., list Jan. 1, 1902 ..... 30&5%
P., S. & W. Co..... 40&10&5%

Sweepers, Carpet—

Bissell Carpet Sweeper Co.: ℔ doz.
Superba, Crotch Mahogany..... $36.00
Triumph, Fancy Veneers..... $33.00
Parlor Queen, Fig. Rosewood.. $30.00
Elite, Hungarian Ash..... $29.00
Am. Queen, Fig. Mahogany.... $27.00
Ideal, Bird's-Eye Maple..... $25.00
Grand Rapids, Nickel, Japan $24.00; $22.00
Standard, Nickel, $22.00; Japan. $20.00
Crown Jewel, Nickel, $21.00; Jap. $19.00
Crystal, Glass Top..... $36.00
Grand, 17 in. wide..... $36.00
Club, 24 in. wide..... $54.00
Hall, 28 in. wide..... $60.00

NOTE.—Rebates: 50c per dozen on three dozen lots; $1 per dozen on five-dozen lots; $2 per dozen on ten-dozen lots; $2.50 per dozen on twenty-five dozen lots.

Tacks, Finishing Nails, &c.

American Carpet Tacks... 90&25%
American Cut Tacks..... 90&25%
Swedes' Cut Tacks..... 90&25%
Swedes' Upholsterers'.... 90&35%
Gimp Tacks..... 90&35%
Lace Tacks..... 90&35%
Trimmers' Tacks..... 90&25%
Looking Glass Tacks..... 65%
Bill Posters' and Railroad Tacks, 90&40%
Hungarian Nails..... 80&10%
Finishing Nails..... 70%
Trunk and Clout Nails..... 80%

NOTE.—The above prices are for Straight Weights.

Miscellaneous—

Double Pointed Tacks..... 90&10@90&10&10&5%
See also Nails, Wire.

Tanks, Oil and Gasoline—

Wilson & Friend Co.:

Gal.	Gasoline	Oil
30	$2.75	$3.00
60	$3.50	$4.00
120	$5.00	$5.75

Tapes, Measuring—

American Asses' Skin ..50@—%
Patent Leather..... 25@30&5%
Steel ..... 33 1-3&5%
Chesterman's ..... 25@25&5%
Keuffel & Esser Co.:
Favorite, Ass Skin..... 40&10@50%
Favorite, Duck and Leather..... 25&5@25&10%
Metallic and Steel, lower list, 35@35&5%; Pocket, 35@35&5%.
Lufkin's:
Asses' Skin..... 40&10@50%
Metallic ..... 30@30&5%
Patent Bend, Leather.... 25&5@25&10%
Pocket ..... 40@40&5%
Steel ..... 33⅓@35%
Wiebusch & Hilger:
Chesterman's Metallic, No. 3ML, etc. 25%
Chesterman's Steel, No. 1038L, etc. 35%

Teeth, Harrow—

Steel Harrow Teeth, plain or headed, ⅝-inch and larger... per 100 lbs. $2.75@$3.00

Thermometers—

Tin Case, Cabinet, Flange, Dairy, &c..... 30@33⅓%

Ties, Bale—Steel Wire—

Single Loop..... 80&10&5%
Monitor, Cross Head, &c. 70&2½%

Tinners' Shears, &c.—

See *Shears, Tinners', &c.*

Tinware—

Stamped, Japanned and Pieced, sold very generally at net prices.

Tire Benders, Upsetters, &c.

See *Benders and Upsetters, Tire.*

Tools—Coopers'—

L. & I. J. White..... 20@20&5%

Haying—

Myers' Hay Tools..... 45%

Miniature—

Smith & Hemenway Co.'s, Davidson, ℔ doz., Nickel Plated, $1.50; Gold Plated..... $2.00

Saw—

Atkins' Cross Cut Saw Tools.... 35&5%
Simonds' Improved..... 33⅓%
Simonds' Crescent..... 25%

Ship—

L. & I. J. White..... 25%

Transom Lifters—

See *Lifters, Transom.*

Traps—Fly—

Balloon, Globe or Acme, doz. $1.15@$1.25; gro..... $11.50@12.00
Harper, Champion or Paragon, doz. $1.25@1.40; gro. $13.00@13.50

Game—

Limitation Oneida.. 75@75&10&5%
Newhouse ..... 45@45&5%
Hawley & Norton..... 65%
Victor ..... 75@75&10%
Oneida Community Jump..... 50%
Hector ..... 75@75&10%

Mouse and Rat—

Mouse, Wood, Choker, doz. holes 12¢
Mouse, Round or Square Wire, doz. 85@90¢
Marty French Rat and Mouse Traps (Genuine):
No. 1, Rat, ℔ doz., $13.25; case of 24 ..... $11.50 doz.
No. 3, Rat, ℔ doz., $6.50; case of 50 ..... $5.75 doz.
No. 3½, Rat, ℔ doz. $5.25; case of 72 ..... $4.70 doz.
No. 4, Mouse, ℔ doz. $3.85; case of 150 ..... $3.00 doz.
No. 5, Mouse, ℔ doz. $3.00; case of 150 ..... $2.25 doz.

Trowels—

Disston Brick and Pointing..... 25%
Disston Plastering..... 20%
Disston "Standard Brand" and Garden Trowels..... 30%
Kohler's Steel Garden Trowels, ℔ gro., 5 in., $4.80; 6 in., $6.00.
Never-Break Steel Garden Trowels.. ℔ gro. $6.00
Woodrough & McParlin, Plastering. 25%

Trucks, Warehouse, &c.—

B. & L. Block Co.:
New York Pattern..... 50&10%
Western Pattern..... 60&10%
Handy Trucks..... ℔ doz. $16.00
Grocery ..... ℔ doz. $15.00
McKinney Trucks..... each, net $10.00
Model Stove Trucks..... ℔ doz. $18.50

Tubs, Wash—

M'f'gr's list, price per gross.

No.	0	1	2	3
Galvanized.	$67	$79	$89	$99

10%

Twine, Miscellaneous—

Flax Twine:
No. 9, ¼ and ½-lb. Balls. 23@25¢
No. 12, ¼ and ½-lb. Balls. 21@23¢
No. 18, ¼ and ½-lb. Balls. 18@20¢
No. 24, ¼ and ½ -lb. Balls. 17½@19½¢
No. 36, ¼ and ½-lb. Balls. 17@19¢
Chalk Line, Cotton ½-lb. Balls ..... 26@31¢
Cotton Mops, 6, 9, 12 and 15 lb. to doz. ..... 11@19¢
Cotton Wrapping, 5 Balls to lb., according to quality... 15½@25¢
American 2-Ply Hemp, ¼ and ½-lb. Balls..... 14½@15½¢
American 3-Ply Hemp, 1-lb. Balls ..... 15½@16½¢
India 2-Ply Hemp, ¼ and ½-lb. Balls (Spring Twine). 10½@11½¢
India 3-Ply Hemp, 1-lb. Balls 10½@11½¢
India 3-Ply Hemp, 1½-lb. Balls, 10@11¢
2, 3, 4 and 5-Ply Jute, ½-lb. Balls ..... 13½@14½¢
Mason Line, Linen, ½-lb. Bls. 47¢
No. 26½ Mattress, ¼ and ½-lb. Balls, according to quality, 30@60¢
Wool, 3 to 6 ply.... B 9¢; A 10¢

Vises—

Solid Box..... 50@50&10%

Parallel—

Athol Machine Co.:
Simpson's Adjustable..... 40%
Standard 40%
Amateur 25%
Columbian Hdw. Co..... 40%
Fisher & Norris Double Screw, net, each, Nos. 2, $10.50; 3, $16.00; 4, $20.50; 5, $27.00.
Fulton Mach. & Vise Co.:
Reed, Swivel..... 25%
Star, Solid Jaw..... 40%
Hollands':
Machinists' ..... 40@40&5%
Keystone ..... 65&5@70%
Lewis Tool Co.:
Adjustable Jaw..... 30%
Monarch, 50%; Solid Jaw..... 50%
Massey Vise Co.:
Clincher 40%
Perfect, 15%; Lightning Grip..... 15%
Merrill's 20%
Millers Falls Oval Slide Pattern. 60&10%
Parker's:
Victor, 20@25%; Regulars..... 20@25%
Vulcan's ..... 40@45%
Combination Pipe..... 55@60%
Prentiss ..... 20@25%
Rock Island 25%
Snedicker's X. L..... 33⅓%
Stephens' 33⅓%

Saw Filers—

Disston's D 3 Clamp and Guide, ℔ doz., $24.00, 30%; Clamps..... 30%
Perfection Saw Clamps, ℔ doz.... $4.50
Reading 60%

Wood Workers—

Fulton Mach. & Vise Co.:
Reed 25%
Star 40%
Massey Vise Co.:
Lightning Grip, 15%; Perfect..... 15%
Wyman & Gordon's Quick Action, 6 in., $6.00; 9 in., $7.00; 14 in., $8.00.

Miscellaneous—

Holland's Combination Pipe.. 60@60&5%
Massey's Quick Action Pipe..... 40%
Parker's Combination Pipe:
87 Series, 60%; 187 Series, 60&5%; No. 870 ..... 40%
Rock Island Pipe..... 25%

Wads—*Price per M.*

B. E., 11 up..... 60¢
B. E., 9 and 10..... 70¢
B. E., 8..... 80¢
B. E., 7..... 80¢
P. E., 11 up..... $1.00
P. E., 9 and 10..... 1.25
P. E., 8..... 1.50
P. E., 7..... 1.50
} *Dis. 15%*
Ely's B. E., 11 and larger. $1.70@1.75
Ely's P. E., 12 to 20.... $3.00@3.25

Ware, Hollow—Cast Iron, Hollow—

Stove Hollow Ware:
Enameled ..... 45&10%
Ground ..... 50&5%
Plain or Unground..... 60%
Country Hollow Ware, per 100 lbs. $3.00
White Enameled Ware:
Maslin Kettles..... 65&10%
Covered Wares:
Tinned and Turned..... 35&10%
Enameled ..... 45&10%
See also *Pots, Glue.*

Enameled—

Agate Nickel Steel Ware..... 33⅓%
Iron Clad Ware..... 70&10%
Lava and Volcanic, Enameled.. 40&10%

Tea Kettles—

Galvanized Tea Kettles:

Inch.....	6	7	8	9
Each	45¢	50¢	55¢	65¢

Steel Hollow Ware—

Avery Spiders and Griddles.. 65@65&5%
Avery Kettles..... 60%
Porcelained ..... 50&5@50&10%
Never Break Spiders and Griddles.. 65&5%
Never Break Kettles..... 60%
Solid Steel Spiders and Griddles. 65&5%
Solid Steel Kettles..... 60%

Warmers, Foot—

Pike Mfg. Co., Soapstone.... 40@40&10%

Washboards—

Solid Zinc: ℔ doz.
Crescent, family size, bent frame. $4.05
Red Star, family size, stationary protector $4.05
Double Zinc Surface:
Saginaw Globe, family size, stationary protector..... $3.55
Cable Cross, family size, stationary protector..... $3.60
Single Zinc Surface:
Naiad, family size, open back, perforated $3.00
Single Saginaw Globe..... $2.85
Brass Surface:
Brass King, Single Surface, open back $4.05
Nickel Plate Surface:
No. 1001 Nickel Plate, Single Surface $3.60
Glass Surface:
Glass King, Single Surface, open back $3.95
Enamel Surface:
Enamel King, Single Surface, ventilated back..... $3.95

Washers—Leather, Axle—

Solid ..... 80&10@90%
Patent ..... 90@90&5%
Coil: ⅞ 1 1¼ 1¼ Inch.
11¢. 12¢. 13¢. 15¢. per box

Iron or Steel—

Size bolt.... 5-16 ⅜ ½ ⅝ ¾
Washers... $5.90 5.00 3.70 3.50 3.30
The above prices are based on $5.50 off list.
In lots less than one keg add ½¢ per lb.; 5-lb. boxes add ½¢ to list.

Cast Washers—

Over ½ inch, barrel lots..... per lb. 1¾@2¢

Wedges—

Oil Finish..... lb., ..@3¢

Weights—Hitching—

Covert Mfg. Co..... 30&2%

Sash—

Per ton, f.o.b. factory:
Eastern District..... $30.00
Southern Territory. $24.00@25.00
Western and Central Districts ..... $25.00@28.50

Wheels, Well—

8-in., $2.22; 10-in., $2.82; 12-in., $3.36; 14-in., $4.80.

Wire and Wire Goods—

Bright and Annealed:
6 to 9..... 72&10&7½%
10 to 18..... 72½&10&10%
19 to 26..... 75&10&10&2½%
27 to 36..... 77½&10&7½%
Galvanized:
6 to 9..... 72½&10%
10 to 14..... 72½&10&5%
15 to 16..... 72½&10&5%
17 to 18..... 72½%
19 to 26..... 70&5&2½%
27 to 36..... 65&10&10%
Coppered:
6 to 9..... 65&10&10%
10 to 14..... 70&10&5%
15 to 18..... 65&10&10&10%
19 to 26..... 70&5&2½%
27 to 36..... 72½&10&2½%
Tinned:
6 to 18..... 67&10&10%
Brass ..... 17¼¢ lb., base
Copper ..... 32¢ lb., base
Cast Steel Wire..... 50%

Spooled Wire—

Annealed and Tinned.... 70&10%
Brass and Copper..... 60&10%
Retailers' Assortments, per box, $2.10@$2.40
Wire Clothes Line, see Lines.
Wire Picture Cord, see Cord.

Bright Wire Goods—

Steel Wire Goods..... 90&15%
Brass Wire Goods.... 90@90&10%
Brass Cup and Shoulder Hooks, 80&15%

Wire Cloth and Netting—

Galvanized Wire Netting.. 80&5%
Painted Screen Cloth, 100 ft., $1.35
Standard Galv. Hardware Grade: Per 100 sq. ft.
Nos. 2, 2½ & 3 Mesh..... $3.40
Nos. 4 and 5 Mesh..... $3.65
No. 6 Mesh..... $3.90
No. 8 Mesh..... $4.40

Wire, Barb—See *Trade Report*

Wrenches—

Agricultural ..... 75@75&10%
Alligator or Crocodile.. 70&10@75%
Baxter Pattern S Wrenches... 70&5@70&10%
Drop Forged S..... 45@45&5%
Acme ..... 60&10%
Alligator Pattern, 70%; Bull Dog.. 70%
Bemis & Call's:
Adjustable S, 40%; Adjustable S Pipe, 40%; Briggs Pattern, 40%; Combination Bright, 40%.
Steel Handle Nut..... 50%
Combination Black..... 40&5%
Merrick Pattern..... 50%
Boardman's 40%
Coes' Genuine Knife Hdl.. 40&10&5&5%
Coes' Genuine Steel Hdl.. 40&10&5&5%
Coes' Genuine Key Model. 40&10&5&5%
Coes', Genuine Hammer Handle..... 40&10&5&5%
Coes' "Mechanics'"... 40&10&10&5&5%
Donohue's Engineer..... 40&10%
Eagle 70%
Gem Pocket..... 30%
Hercules 70%
W. & B. Machinist:
Case lots..... 50&5%
Less than case lots..... 50%
W. & B. Railroad Special:
Case lots..... 50%
Less than case lots..... 40&10&5%
Solid Handles, P., S. & W., 50&10%; full cases..... 50&10&5%
Stillson 65%
Uwanta Wrench Co.:
Railroad Special, Iron Handle, 40&10&5%
Other Wrenches..... 50%
Vulcan and Agrippa Chain..... 50%

Wrought Goods—

Staples, Hooks, &c., list March 17, '92..... 90%

Zinc— *(Cask lots at mill.)*

Sheet..... per 100 lb., $7.50

For the Table of "Current Metal Prices" see the First Issue of Every Month.